THE INDEPENDENT GUIDE TO IBM-STANDARD PERSONAL COMPUTING

VOLUME 5 NUMBER 7 APRIL 15, 1986

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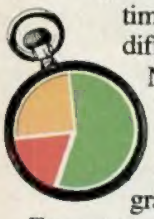
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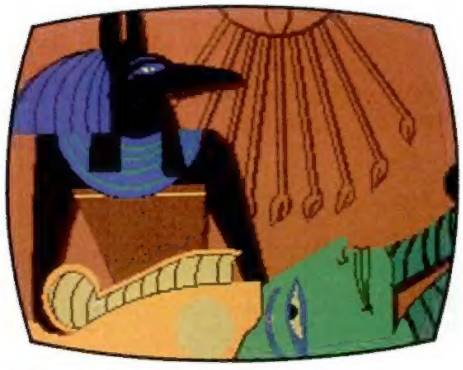
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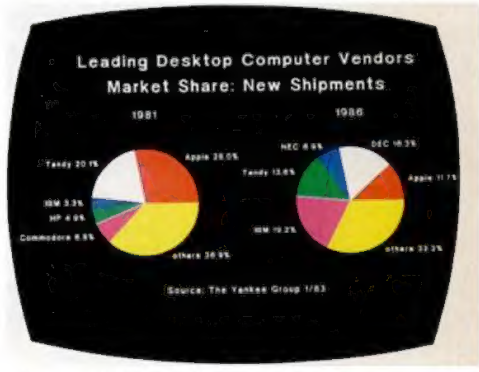
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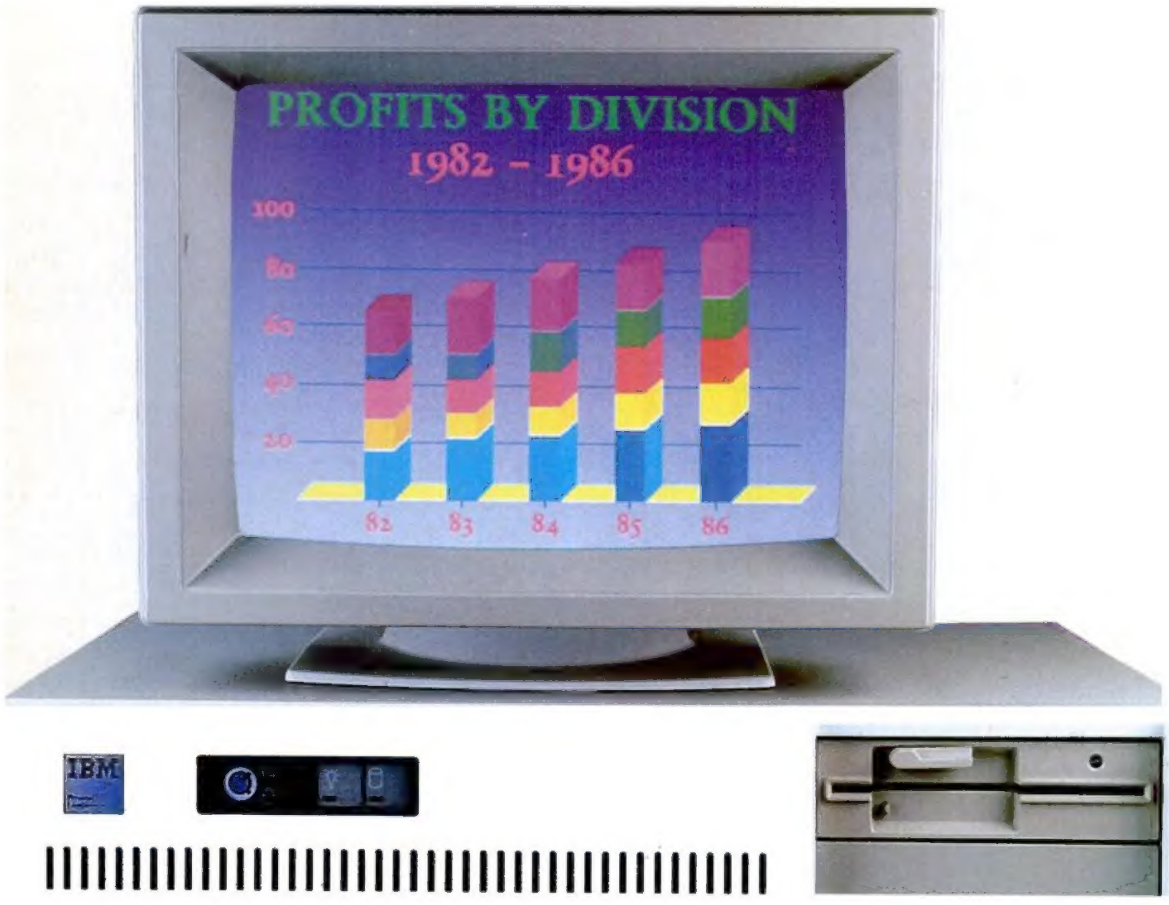
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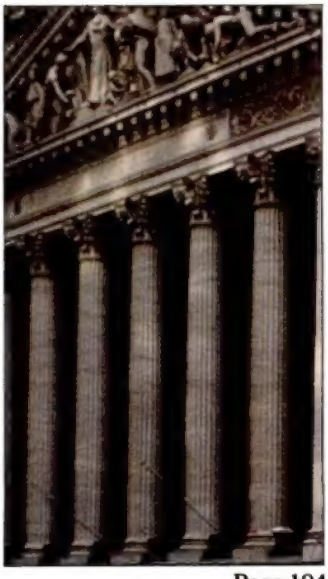
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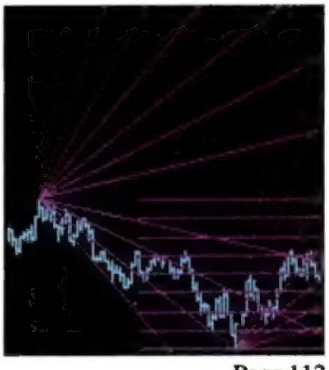
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Rating Investment Software
Thomas A. Meyers/One out of five Americans invested in the stock market last year. Many of these investors used their PCs to analyze and track their investments. For this special issue, *PC Magazine* enlisted the aid of three renowned brokerage firms to evaluate 48 software packages in three areas—technical analysis, fundamental analysis, and portfolio management. The best of these packages eliminate tedious number crunching and allow savvy investors to concentrate on the brainwork of analysis..... 104



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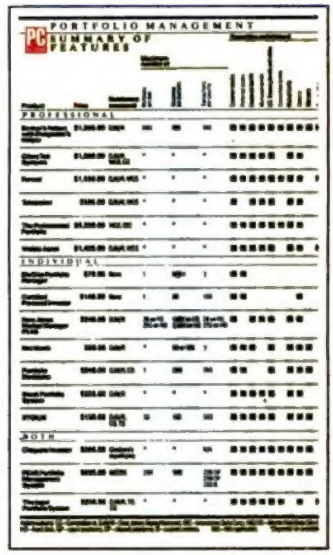
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By now you're probably familiar with *PC Magazine*'s massive single-topic issues on subjects such as word processors, database managers, and printers. While these are all familiar topics, we also like to break new ground. That's one reason why we're devoting an entire issue to packages designed to help you select and keep track of your investments. Never before has any magazine attempted such a comprehensive guide to investment software.

We've noticed a groundswell of interest in software for this field. This is probably because the average *PC Magazine* reader, as results from our most recent subscriber study reveal, is a manager or professional with an average income of $66,000—similar to the profile of the typical upscale American investor.

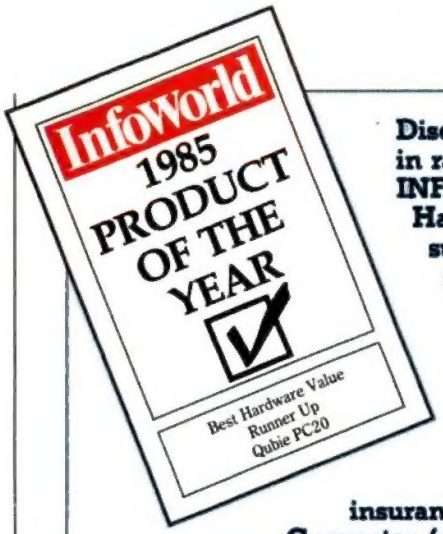
To meet our readers' desire for knowledge about software for investments, we enlisted the aid of three of the nation's top brokerage houses to review nearly 50 such packages. The technical research department at Smith Barney, Harris Upham & Co. Inc. scrutinized 25 technical analysis packages (page 113). Dean Witter Reynolds's microcomputer support experts evaluated 7 fundamental analysis packages (page 163). And Shearson Lehman Brothers' advanced technology group tested 16 portfolio management packages (page 183).

We didn't stop there. Frequent contributor Phil Wiswell reports on how you can ease into the market by honing your investment skills on some of the more popular stock market computer simulations. Michael Gianturco reviews some of the best books on the subject on page 303. And for those who prefer to use the software already on their shelves to track their investments, on page 227 Thomas Meyers explains how to use a spreadsheet to do the job.

The driving forces behind this special issue, project manager Cheryl Goldberg and technical expert Meyers (pictured above) lined up the reviewers at the brokerages, winnowed the hundreds of investment products on the market down to 48 representative ones, and designed the editorial package. "When I first became involved with this project," Goldberg remarked, "I suspected that computers could remove some of the drudgery involved with tracking the market. But we discovered that computers have invaded every nook and cranny of the investment process. While software exists to help with all aspects of stock market analysis and tracking, some of the most remarkable packages let users back-test trading strategies."

Whether you currently invest in the market or have been curious about getting started, the articles and reviews in this issue will help any serious user become a far more sophisticated investor.

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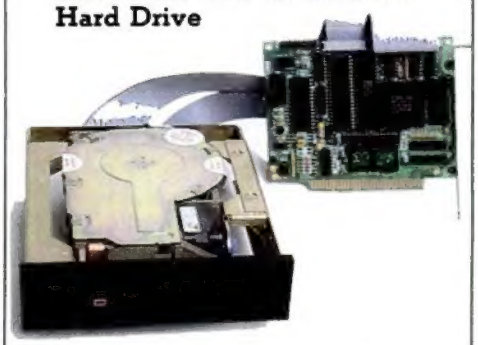
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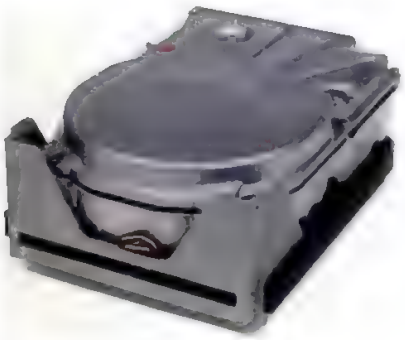
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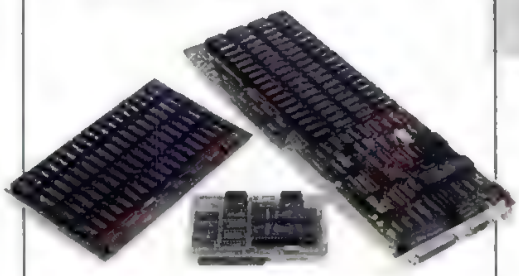


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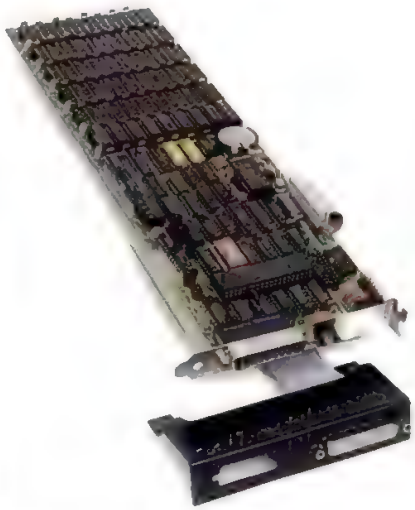
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- Scroll forward or backward when viewing any file; switch instantly between the hex-dump and the normal display, even in the middle of the file.
- The complete Q-DOS users manual is available from within the program.
- Q-DOS works with VDISK, other ram-disk software, and large disk volumes (larger than 32MB).
- Q-DOS lets you hide sensitive files, or protect them from accidental erasures.
- If you have a color monitor, you can customize your Q-DOS display with any colors you wish.
- Q-DOS IS NOT COPY-PROTECTED!!

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On-line context-sensitive help	YES!	no	no
Work with two disks simultaneously	YES!	no	no
Find file on any disk	YES!	no	no
- Typical time to find file on 20MB disk	3 sec!	n/a	n/a
Display directory-tree diagram	YES!	YES	no
- Typical time to scan disk for directory tree	4 sec!	16 sec	n/a
Copy or move files without typing destination directory	YES!	no	no
Will you buy this file manager?	YES!	no	no

System Requirements: IBM PC, XT, AT or compatible. Hard disk or two drive recommended. 256K memory, DOS 2.0 or higher.

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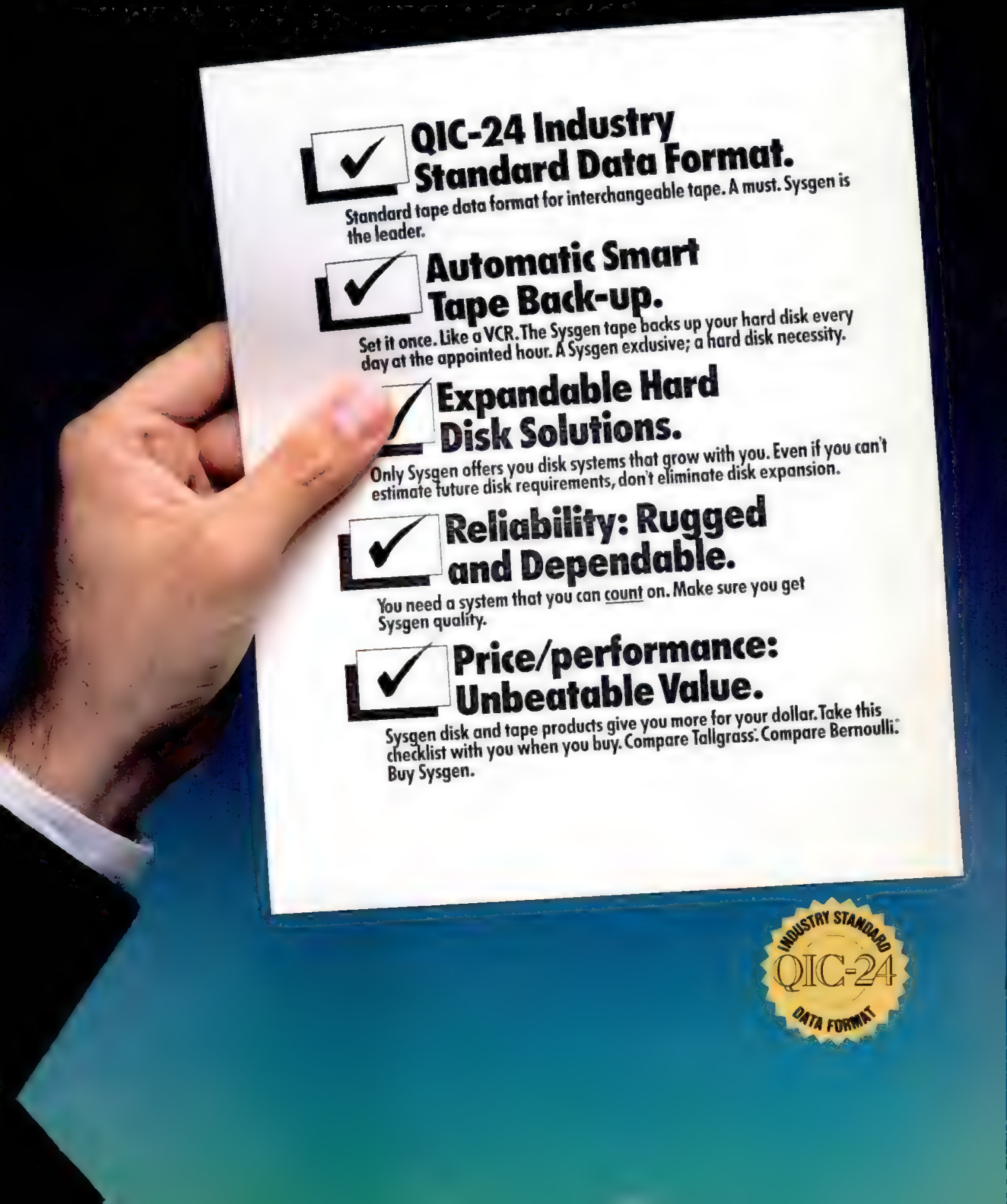
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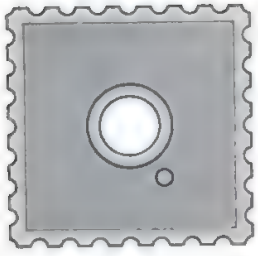
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CIRCLE 364 ON READER SERVICE CARD

LETTERS TO PC MAGAZINE



REFUGEES OF THE COPY WAR

Jared Taylor's article "The Copy-Protection Wars" (*PC Magazine*, Volume 5 Number 1) was well done and quite comprehensive. It neglected to mention, however, a simple 100 percent effective way of bypassing the problems presented by copy-protected software. Solutions that a growing number of users employ: We absolutely refuse to buy such programs.

Ralph F. Keuler
Seattle, Washington



BEGINNERS BLUE IN THE FACE

Your editor's response to reader Bart Forbath's letter to *PC Magazine* in Volume 5 Number 1 sounded so ill-tempered and came so close to being a put-down that it bordered on expressing both a snotty and a reader-be-damned attitude.

A PC owner for over 3 years, I am still a beginner in many areas. I regularly attend meetings with three PC user groups and have heard lots of beginners' questions patiently answered by more-experienced users. No one has ever in my hearing been put down, and no one is asking you folks to say, "This is a floppy disk...." Your cavalier treatment of Mr. Forbath is totally inexcusable.

The Reverend George T. Cook
Wyoming, Rhode Island

Maybe you guys have forgotten how it feels to be all alone with no one to turn to for answers. Perhaps you don't understand the need of what should be (given the excellence of your magazine) your increasing readership.

Are you sure about your survey claiming all your readers "know the basic ropes"? There is a lot of machoism attached to using computers these days, so maybe your readers were afraid to say what they didn't know. Witness the end of Terry Carpenter's letter wherein Carpenter admitted, "I'd rather die than ask someone to explain some of the more elementary points of operating systems."

Whether you like it or not, you are perceived as a source of information to us novices, and we are going to keep writing to you for help until you acknowledge us on our terms.

Reta J. Kenter
Columbia, Maryland

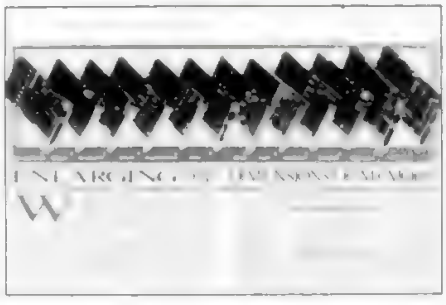
You're right—computers are hard to master. That's why columns such as PC Tutor, User-to-User, and Spreadsheet Clinic are so popular. PC Advisor and our hands-on reviews help you make smart purchasing decisions regardless of your expertise. We created PC Lab Notes to continue our hands-up-the-ladder tradition. Through PC Labs, we also work closely with manufacturers around the country to make the next generation of hardware and software easier to learn and use.

You're really being too hard on yourself; if you're proficient in one area and feel lost in others, you're not alone. We've helped tens of thousands of readers get up to speed on all manner of subjects, but it requires an effort.—Ed.

PC'S LIMITED AT PROBLEMS

Winn L. Rosch is a fantastic journalist, and I'm quite impressed by his tremendous productivity. He mentioned in the December 24th issue (PC News, *PC Magazine*, Volume 4 Number 26) that the PC's Limited AT was an excellent machine and that after 3 weeks of use he had found no bugs in it.

I ordered a PC's Limited AT, and it was clear in my mind that the machine had an unconditional, 30-day warranty if it did



not run some of the major software, and that if not satisfied I could return it for a full refund.

I found problems immediately after installing the software from my true-blue IBM AT. The combination of CTRL-BREAK does not work in *1-2-3*, whether in macro or "/" commands. This renders *1-2-3* worthless.

Fastback, Version 5.0, doesn't run, but 4.5 works. PC's Limited AT has a different DMA controller chip and Fastback can't be configured to run at full speed.

Though a power user (I'm in charge of the Yale University IBM PC Users Group, an IBM AT owner, an M.D., and a Ph.D.), I have not been able to solve these and other problems with the PC's Limited AT. I suspect they're related to an incom-

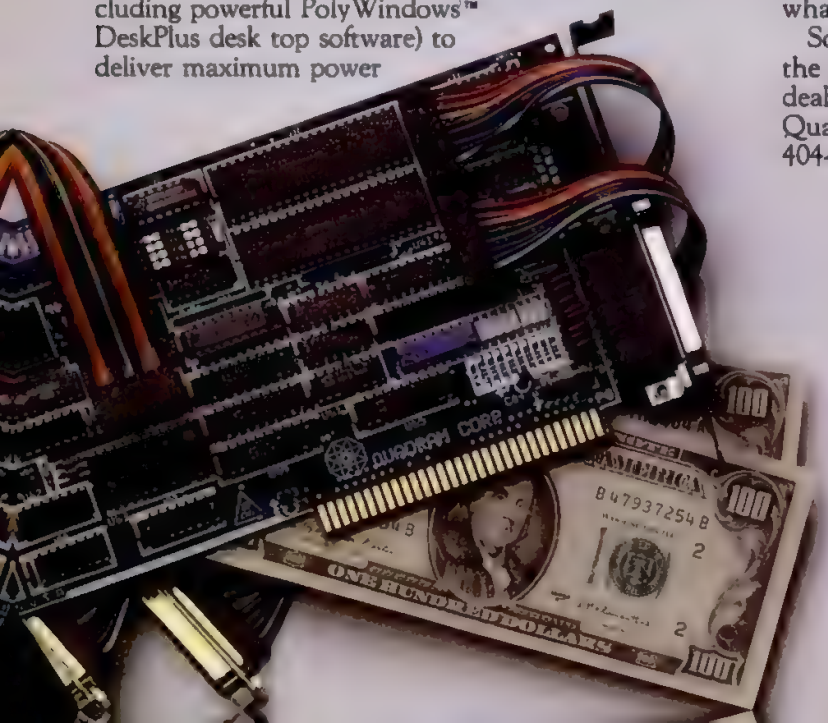
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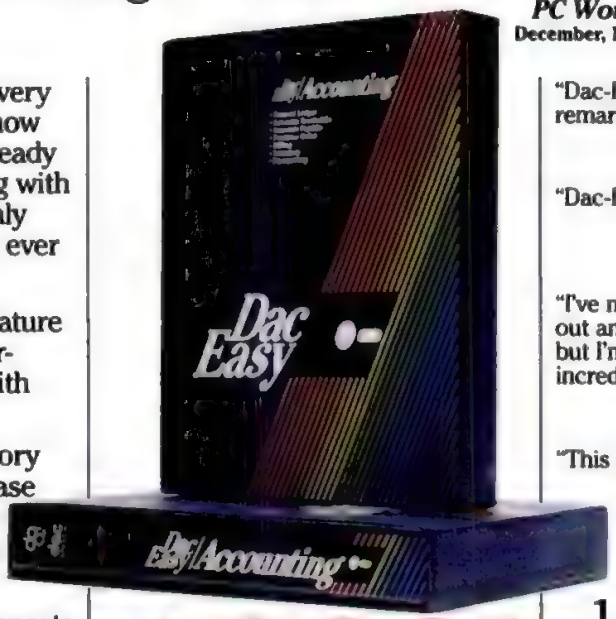
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CIRCLE 149 ON READER SERVICE CARD

■ LETTERS

patible ROM BIOS. I learned they used a Mitsubishi ROM BIOS and not one from Phoenix, as mentioned over the phone during the pre-order inquiry.

Philippe Jeanty
Branford, Connecticut

Winn L. Rosch replies:
I contacted PC's Limited about Dr. Jeanty's difficulties and learned that he had already been sent a refund for his full purchase price.

■ The PC's Limited AT did, in fact, have problems when running Version 2 of 1-2-3. This problem was solved in October 1985 with an update to the Faraday ROM BIOS.

Although several of Dr. Jeanty's difficulties sound unusual to me, some of the early models of the PC's Limited AT did, in fact, have problems when running Version 2 of 1-2-3 *(but not Version 1A, with which I tested the computer) as well as a few other programs. This problem was solved in late October 1985 with an update to the Faraday Electronics (not Mitsubishi or Phoenix) ROM BIOS. A free update ROM is being offered by PC's Limited to all the owners of the earlier versions.*

To determine whether the ROM in your AT at home requires updating, run DOS's DEBUG program, type in the instruction D FE00:0000 (using zeros, not capital "ohs"), and then press the Enter key. The ROM identification will appear on the upper right-hand corner of the screen. If your computer displays the Version number 2.55, 2.56, or 2.57, you should definitely get an update by calling (512) 339-6963. Have your invoice number ready when you call.

MIA KULPA

A clever test to see how closely *PC Magazine* readers actually read sidebars accompanying articles would be deliberately to misspell a word—especially when the article in question is "Banish Typos with Spelling Checkers" (*PC Magazine*, Volume 4 Number 26).

I found it oddly amusing (verging on droll) that located in the closing paragraph of the sidebar "Stalking the Elusive Synonym" is a misspelled word. *Vocabulary* is not spelled *vacabulary* unless my spelling is in error.

Larry R. Correa
Irvine, California

DECISION SEXISM?

I was disgusted and outraged with Stephen Manes's column "Flossie or the Tractor?" (Computers in Society, *PC Magazine*, Volume 5 Number 2). Not until the end of the article do you learn that Flossie is not a mule but a human being: the narrator's wife. This tired old joke—woman as object, less than human, comparable to a tractor—is degrading to women and to any person who tells it.

I am the father of two daughters and am married to a woman I love and respect, and I feel personally affronted by this sick attitude.

Generally, I look forward to your magazine. I often learn something and am always entertained. But I'd like to punch Manes out as well as the editor who let the column slip by.

William Menchan
Austin, Texas

Stephen Manes replies:
A few defenseless women who understand neither humor nor irony will undoubtedly applaud Mr. Menchan's single-fisted revival of chivalry. The rest of womankind will undoubtedly chuckle at his wrath, his pugnacity, and his pedestal.

JRAM BACKFILL

The well-written article that compared the various EMS memory cards ("Enlarging the Dimensions of Memory") was correct in nearly everything, except that it claimed the JRAM-3 doesn't backfill memory. *Backfill* is a term I thought synonymous with rounding DOS size up to the max. The JRAM-3 does, in fact, backfill quite a bit of memory, up to 704K bytes in the appropriate configuration.

Troy Stone
Tall Tree Systems
Palo Alto, California

ALL TOGETHER NOW

You evaluated 12 memory boards that employ bank-switching in your January 14 issue ("Enlarging the Dimensions of Memory," *PC Magazine*, Volume 5 Number 1), but not the ALL Card from ALL Computers, which claims that its memory-management scheme is superior to bank-switching. Why was this so?

Christopher Chandler
Cuyahoga Falls, Ohio

Charles Petzold replies:
The ALL Card was originally among the expanded memory boards to be reviewed for that issue, but a bug in its expanded memory manager driver prevented it from working correctly. The ALL Card crashed my test program and it crashed Symphony. *(ALL Computers later reported to us that it fixed the bug, but by that time it was too late to be included in the issue.)*

The other features of the ALL Card were beyond the scope of that article, which concerned only boards that supported extended memory or the Lotus/Intel/Microsoft Expanded Memory Specification. I was personally interested in testing the other features of the All Card but discovered that the time required to decode the ALL Card documentation prohibited such a project.

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Do you have a comment, compliment, or criticism about something you've read in *PC Magazine*? A question you'd like to open up to other readers? Then send your opinion on paper or disk to Letters to *PC Magazine*, One Park Avenue, New York, NY 10016, or send your opinion through MCI Mail to PCMAGAZINE at address 157-9301. We're sorry that we're not able to answer letters personally.

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WordPerfect 4.1 Performance Report

A +5 extra points

A lot of people have been saying a lot of good things about WordPerfect, lately. In fact, our 4.0 version has been called the industry standard for word processing.

Of course, our first reaction was smiles all around (and a celebration or two). Our second reaction? Back to work on WordPerfect. Not because it isn't already a great program. But because the one thing that has made WordPerfect a success is our commitment to constant improvement. Reaching for perfection.

The latest result of that commitment is WordPerfect 4.1. And with several new features, it scores more than a few extra points.

1. Thesaurus

With a built-in thesaurus, WordPerfect 4.1 lets you choose synonyms for any words in your document.

2. Split Screen

By splitting the screen horizontally, you can view two documents at the same time. And editing either document or moving text between the two windows is fast and easy.

3. Text Columns

Columns are displayed side-by-side on the screen. In addition to newspaper-style columns, WordPerfect 4.1 includes parallel columns, ideal for scripts.

4. Line Drawing

Horizontal and vertical lines can be drawn and configured to form boxes or other graphic applications. Many available line styles include single, double and asterisks.

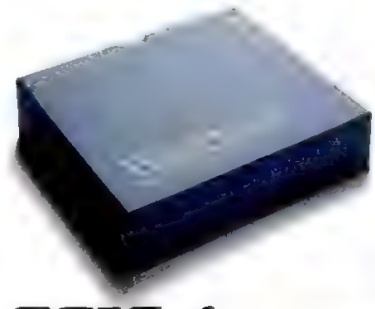
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CIRCLE 513 ON READER SERVICE CARD

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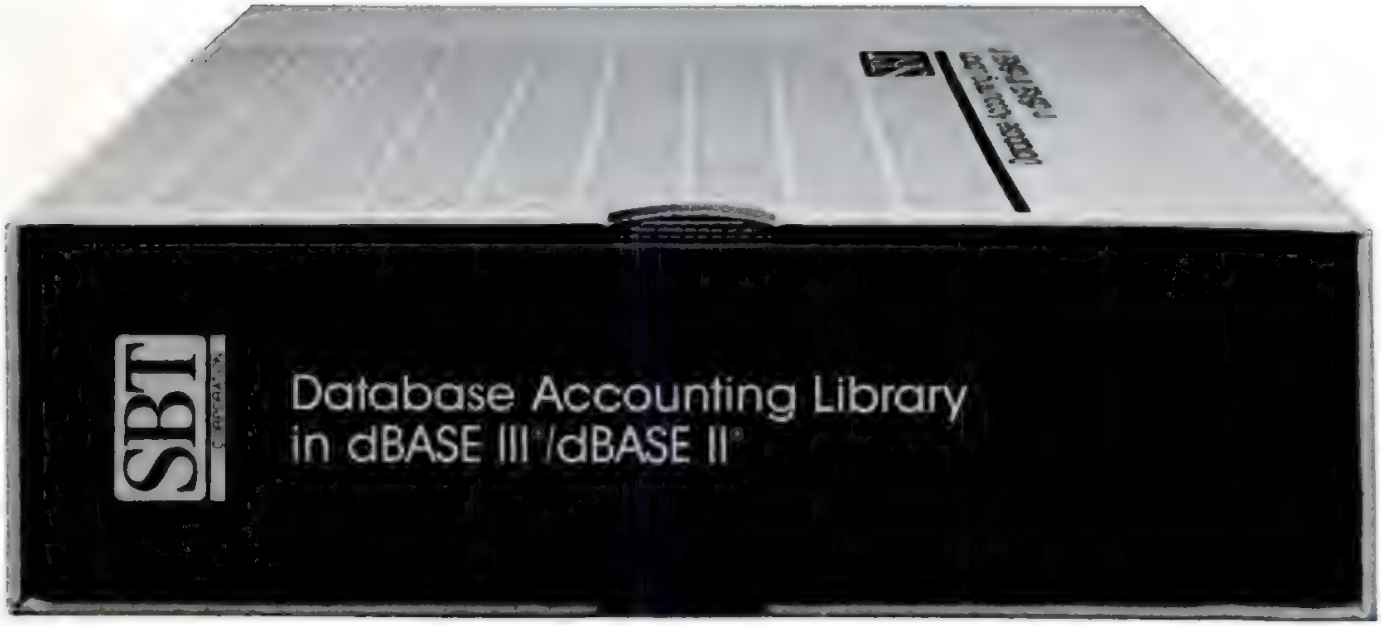
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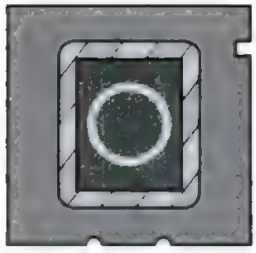
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■ **EDITED BY GUS VENDITTO**

PC ADVISOR



The PC Advisor helps readers choose the best hardware and software products to meet their specific needs.

MAPPING SALES

I am looking for a graphics package that will produce a map of the United States (by state) showing different colors for different values, such as sales up, sales down, and so forth.

I would like to run this software on an IBM PC-XT with 640K bytes of RAM. I use a Hewlett-Packard 7475A plotter.

Jerry Levy
Earth City, Missouri

Any graphics software program that includes freehand drawing in its arsenal of techniques would allow you to draw and illustrate a map, but that's a cumbersome chore for anyone without natural drawing talent. Many graphics programs—especially those for business presentations—are based on libraries of images. The better ones continuously add to the available symbols. Exploded pies and 3-D charts are being joined by pictures of everything from porpoises to palm trees in corporate communications.

Representing sales by state in a map is clearly a terrific way to put figures across. The best way to do it is with a presentation software product that has a library of maps.

We can recommend two that will work with your plotter. An explanation of their features should help you choose one.

VCN ExecuVision *(Visual Communication Network Inc., Cambridge, MA 02142; (617) 497-4000; $395) was called "the Cadillac of presentation graphics" when we reviewed it (see "Business Graphics: Giving Power to Presentations,"* PC Magazine, *Volume 4 Number 12). To create a sales-by-state presentation, you'll need the International Atlas library, 1 of 19 offered by VCN at $90 each (with discounts for multiple purchases). You'll be able to color particular states and print text within them. You can also highlight towns or districts within a state, a task you'll find easier with a mouse.*

While VCN does not officially support the use of a mouse, it will provide the source code (this means it will give you the software to run a mouse, but it can't offer help in how to use it with ExecuVision*).*

There are two ways to create your graph with ExecuVision*: You can enter your data from scratch or capture a screen while running another applications program (if you buy the $75* EV Capture *module from VCN).*

Freelance *(Graphic Communications Inc., Waltham, MA 02254; (617) 890-8778; $395) doesn't offer as many options as* ExecuVision*, but you don't pay extra for its more than 200 symbols (including maps of the 50 states).* Freelance*'s major selling points are its ease of use and its ability to import ASCII text and Lotus's* 1-2-3 *.PIC files for charting. It comes with mouse and digitizing tablet support.*

■ Exploded pies and 3-D charts are being joined by pictures of everything from porpoises to palm trees in corporate communications.

ADDING RAM TO A Z-150, PART 2

A small army of Z-150 users has come forward to challenge the advice we gave in this column in Volume 5 Number 3 that a Zenith Z-150 PC could be upgraded with 64K-bit chips up to 320K bytes of RAM and that a memory board should be used to add more RAM up to 640K. Well, we knew that 256K-bit chips can be used on a Z-150 to add 640K bytes of RAM on the main memory board and, as we noted then, a new PAL chip is needed. Since this is undocumented (the Zenith manual, in fact, states that no more than 320K bytes can be addressed on the primary memory board) and we then knew of no sources for the PAL, we thought Z-150 users would be better off adding a new board to bring memory beyond 320K. Fervent Z-150 fans recommend the RamPal chip (Software Wizardry, St. Charles, MO 63301; (314) 946-1968; $39) as a cheap, effective way to add RAM. With the RamPal you'll be able to boost RAM in increments of 256K all the way up 640K.

ASK THE ADVISOR

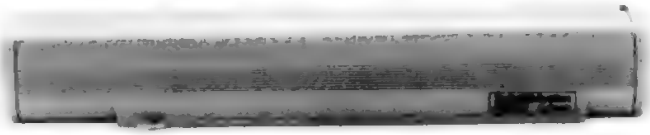
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KEEPING TRACK OF SALES

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Try the Lotus Graph function to print out a visual representation of your analysis.

Both of these Lotus models were written by Robert and Lauren Flast, and appeared in 1-2-3™ RUN! Use the Cauzin communications program to read the data strips to a data disk. The Lotus Retrieve command brings the model into a Lotus spreadsheet.

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32 DOS extensions: file and directory manipulation for DOS 1.1 and 2.0.

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BTRIEVE

BEST BUY!

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This monarch of file managers has always been off-limits to programmers for whom royalties would ruin profit margins. So it's quite a proclamation indeed that one need no long pay a tithe to incorporate Btrieve™ in applications.

Btrieve is fully developed and fast. It takes complete charge of all file indexing, reading, writing, insertion and deletion. It builds 22 commands right into the language you use in the form of functions you call to tell Btrieve what to do. The commands create, open, and close files; delete and insert records, recapturing vacated space; find records which exactly or most nearly match keys; walk files by ascending or descending key.

Btrieve's foundation is a balanced-tree indexing scheme, conceded to be the fastest search technique devised (it will find any key in a million-plus item index in four or less accesses).

Btrieve comes with interfaces to C, Pascal, BASIC, and COBOL, and the manual gives you working sample programs which demonstrate every command in all four languages. The kind of presentation which led *PC World* to exclaim "for those of us who have endured poorly written and inadequate manuals, this one is a pleasure."

Btrieve has mainframe specifications! A single file may have up to 24 indexes. Segments of keys may be indexed. Each index can independently accept or block duplicate keys. A record length can be up to 4090 characters; an index length 255 characters. A file may be 4 billion bytes. It can even extend a file across two drives — even two hard disks!

With Btrieve you are freed to think logically; the physical file is no longer of concern. Gone for good is all that time-wasting dickering with intricate file referencing schemes and sorting algorithms. Thinking shifts to a higher plane.

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PLINK86 & PLUS

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Plink86,™ long the overlord of overlay linkers, now has a Plus version. As a linker Plink can be used with any compiled language which delivers Microsoft/Intel format object files. It yields automatic symbol tables and more memory maps than DOS LINK, but its overlay power has won its reputation as a miracle worker. Plink86 shoe-horns large programs into small memory by binding into your compiled program an overlay manager which knows how to swap modules of large linked programs between disk and shared memory space. Plink86's straightforward overlay description language allows you to describe your overlay hierarchy in a structure permitting up to 4,095 overlays stacked 32 deep.

So if your program needs large chunks of memory, you no longer forego sales to folks who have less. But if you've assumed 128k, and they have 640k, Plink86-Plus™ knows to use extra memory as cache for overlays — at full speed compared to disk swapping. It also can automatically restore a displaced overlay to which a subsequently called overlay must return, and assign library modules to either a program's root segment or overlay areas.

Plink, the programmer's choice even when CP/M™ was the poobah of computing.

Code:	Product:	List Price:	PC Brand:
S0500	Plink86	$395	$289
S0499	Plink86-Plus	$495	$359

C-SPRITE

Lattice's Debugger for Lattice C

We once called it a symbolic debugger, but Lattice® advances now bring your source code on screen for your viewing pleasure. Hand this versatile companion to your compiler a .COM or .EXE file and C-Sprite™'s source mode will display your original program statements during most operations — your function names, your variable names, your data types, and the line numbers from your source code. At any breakpoint you can disassemble the object code and see source and assembler intermingled on screen.

If inclined, you can as well view machine addresses and machine-coded instructions to scrutinize what the compiler (or an assembler) contrived. You can work with data in hex, of course, or specify C's data types to cause the debugger to display memory addresses as strings, long integers, etc., even pointers.

C-Sprite can set breakpoints using symbols or addresses. You can submit clusters of commands to be executed at the breakpoints, or set commands that execute until a condition is met. New features permit redirection of STDIN and STDOUT, display and alteration of 8087 status, the setting of pointer sizes, and a symbol table exceeding 64k.

C-Sprite even has macros. Use your source code variable names in a macro to dump the contents of entire C structures, for example. And you can debug through one of the COM ports with a second terminal so as not to disturb your program's display screen. What's more, if you link with Plink86, C-Sprite can even tackle overlays.

Product Code: L2300 PC Brand:
List Price: $175.00 $149.00

BASIC_C

Use Your Knowledge of BASIC to Learn C

If you're getting the message that switching from BASIC to C would be prudent, you're about to discover that it's back to basics of a different sort. BASIC is fat with hidden functions that stripped down C just doesn't have.

Gone are all those handy string manipulators like LEFT$, MID$, STRING$, etc. In C, when you reach for even simple invocations like INPUT or PRINT — well, underlying such expressions in BASIC are bulging macros which C cannot have if it is to keep its slim profile.

But now comes BASIC_C and all your old favorites are back. Over 80 routines to open and close files, field and perform conversions on file buffers, peek and poke, print using, clear screen, "instr", on error goto. . . they're all there. Some have reworked names and syntax to suit C, but all are written as one-to-one functional equivalents to the familiar features of BASIC. And they are documented one to a page in alphabetical sequence like the Microsoft manual for added familiarity.

So with BASIC_C, when you're thinking INPUT, go ahead. Use it. Or LPRINT or LOCATE or INKEY. But without BASIC_C, you will find that every line of code plunges you back in the C texts to figure out how to write it. Someday you'll want to, but for now, BASIC_C will start you programming quickly at the statement level so that you can concentrate on C's larger concepts.

Product Code: S0350 PC Brand:
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BASTOC

Translates BASIC to C

You'd like to upgrade C, but what to do with that warehouse of BASIC routines you've carefully polished over the years? And how to face converting your famous Leviathan accounting system from BASIC, much less your Labyrinth file management package?

Use BASTOC,™ a translator which takes in BASIC source code and emits pure Kernighan & Ritchie C. Our BASTOC versions understand either Microsoft Extended BASIC or CBasic, with Lattice C as the target. They will optionally convert your program into a single monolithic C function or will decompose it into separate functions, one for each GOSUB label.

Strings are dynamically allocated in the target program, ridding your application of BASIC's catatonic halts for garbage collection. BASTOC will try to create structure of even the most convoluted BASIC code, and writes any indigestible statement into the C output as a comment plus explanation. Also, you optionally can tell BASTOC to insert BASIC source lines into the C target as comments.

BASTOC comes with a runtime library for final link-up with compiled C output. Source code of those modules which contact the operating system is supplied so you can tailor BASTOC to your environment if needed.

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PANEL

Feature-Laden Screen Design Tool

The newest version of this premier programming tool lets you layer your screen designs with up to ten overlapping images, making it easy to background a screen with pop-up lists, help boxes, and alternate sets of input fields.

Writing your own screenware is a good way to blow completion dates and profits. Panel™ works with you interactively to set up foolproof screen displays and data entry forms rapidly. It tests your form to prove that it (and test data) behave correctly, then converts the finished work into C source code for incorporation into your application. Compile with Lattice or Microsoft.

Wonderfully diverse attributes may be selected for any field — size, data type, color, of course, but also conversion of input to upper case; clearance of existing data when new entry is started; masks for standard formats (eg, dates, phone numbers); a choice of styles for numeric fields; phrases which fill in when their first letter is typed; multiple-choice lists from which to choose a field fill-in by cursoring a highlighted bar. Fields may be multi-lined (eg, name and address as one field) and scrolled if larger than the screen space allotted them.

Panel builds in a user interface for keystroke movement within and between fields, and supplies extensive validation routines for checking user field entries — in source code, so you can tack on your own unique variants. Screen designs may be dynamically loaded from file, or compiled into a program, and version 6 has optimized code to quicken display speed.

The whole package is wrapped in a monitor and keyboard customization package to tailor your application for other equipment. Panel. A superior productivity tool now bigger than ever.

Product Code: S0400 * PC Brand:
List Price: $295.00 $229.00

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RUN/C PROFESSIONAL VERSION

Interpreter Now Accesses Binary Libraries

RUN/C was an innovator for converting inaccessible compiled C to an interpreted language as easy to grab hold of as BASIC. Great for learning, but a problem remained for pros An interpreter expects nothing but source code, and that put the vast resource of professional binary libraries off limits.

No longer: RUN/C Professional™ has the tools dynamically to load and unload multiple binary function libraries while in its interpreter Your code can now reach for functions in the commercial C libraries like C-Food Smorgasbord™ . opposite— potentially any library compiled with Lattice's large model How? The manual shows how to develop the interface to a library, using the Lattice compiler (a must!) How about your own archive of functions? No reason why not.

The RUN/C Interpreter

The interpreting engine lies at the heart of both the improved original RUN/C and the new Professional version Its creators had the inspiration to make once formidable C behave on screen much like PC BASIC with a full-screen editor like WordStar® . Just create a program and RUN it. If it stumbles, LIST it, EDIT it, add lines, delete lines, RUN it again, fix it again. Use familiar commands like LOAD, MERGE, SAVE, FILES, even TRON and TRACE, and a free profiler.

RUN/C is ideal for rapid program development. Put up code at high speed, tinker and re-arrange, try out things devil-may-care, and let RUN/C find your typos and malaprops

RUN/C has a treasury of functions built into the interpreter — over 100 paralleling the most used functions found in standard compiler libraries So when and if the time comes to compile, your source code will find counterparts.

There are lots more features — system interrupts, a shell command to invoke any operating system command without leaving RUN/C, even the ability to load a preferred editor in parallel and switch back and forth.

RUN/C Standard Version

Straight RUN/C has all above but the Loadable Libraries™ docking module. It utilizes source code only, whether created by its own editor, or from any ASCII file, such as programs you've already written, or commercial libraries which supply source code.

It makes a splendid teacher The manual has not just instructions how to use RUN/C, but its 500-plus pages provide a thorough-going demonstration of the C language itself. Every feature, of C or RUN/C, is accorded its own micro-chapter. Over 100 of these chapters are devoted to RUN/C's built-in functions, and every one lists a sample program showing how it is used. The programs are also on the disks. So as you read them in the manual, you can run them on the screen (Needs 180k-256k recommended.)

RUN/C Professional

RUN/C Pro has every feature of RUN/C regular plus the binary library link-up and an extra level of debugging aids They are ingeniously installed behind a built-in function, so you can call for debugging conditionally. The called function paints a menu of debugging tools to choose from, including immediate mode to display variables, single-step tracing, and changing of variables.

RUN/C Professional can tackle projects of any size Use it as a creative front end to feed a continuous stream of source code into compiled modules. Only the source work in progress is still interpreted; the finished modules will whiz by at object speeds. It will change how you work. (320k minimum and 512k recommended to fit libraries.)

RUN/C: quite a run for your money

Code:	Product:	List: Price:	PC Brand:
S0910	RUN/C	$120	$109
S0950	RUN/C Pro	$250	$199

LATTICE C VERSION 3.0

NEW RELEASE!

Major Upgrades to the Best Selling C Compiler

Lattice has labored and come forth with the long-awaited Version 3.0 of its top-rated compiler. A long list of enhancements, adoption of the ANSI draft standard, documentation rivaled by few, and add-on libraries matched by none in sheer quantity restore Lattice C™ to its leadership role as the C compiler to beat

Lattice now embraces key UNIX™ enhancements which have entered the language since Kernighan & Ritchie — void functions returning no value, enumerated data types to assign stepped values to variables, the ability to pass data between structures by assignment statements. And 3.0 adopts checking of external function arguments by data type as proposed by ANSI to kill bug swarms when modules join up at link time

The greatly expanded libraries, now comprising 325 functions(!), enable the file sharing and record locking provisions of DOS 3.1, provide a full complement of transcendentals, and a host of utilities to mimic the UNIX and XENIX™ environments

Lattice now delivers smaller EXE files, curing one past complaint, boasts very fast link times and a more efficient aliasing algorithm

The compiler now defaults to the ANSI proposed standard when you need a strict mistress, but command line options tolerate straying. New options generate code to use 80186 and 80286 instructions, and the 8087 is of course sensed and utilized if aboard

Lattice has enjoyed pre-eminence so long that developers have created far more tools to marry into Lattice C than any other compiler Programmers now have an enormous resource of libraries and utilities to use with Lattice to speed their work. William Hunt, in his exhaustive analysis of 12 compilers in the 1/86 issue of the *PC Tech Journal* awards Lattice the only "very good" rating for add-on library availability, puts Lattice in the top three for documentation quality, calling it "one of the most usable in the group"; and sums up with this all-around accolade — "a fine product to consider for the production of important applications."

Product Code:	PC Brand
List Price $500.00	$299.00

BETTER BASIC

New Version Compatible with Microsoft BASICs

If you have several thousand hours of BASIC programming under your wing, what a dilemma the great migration to C poses! BetterBASIC™ offers an ideal sanctuary. Its design principle is simple — build the most useful features of C, Pascal, and Modula 2 into BASIC, while retaining the familiarity of a language known to millions. Version 2.0 is 100% compatible with Microsoft's GW™-BASIC and IBM BASIC and BASICA. Just load old programs and run. Save, and they are converted to BetterBASIC.

BetterBASIC is big. Its hugely expanded features require 192k; your programs can go all the way to the PC's full 640k. It is comfortable. It behaves like Microsoft BASIC at the interactive level, with a full-screen editor, direct statement execution, and always poised to RUN. But it is fast BetterBASIC is not an interpreter It is an incremental compiler. Each line you type is compiled (and error-checked) on the spot just once, not re-interpreted over and over at run time. The Sieve benchmark runs *6 times faster* than with Microsoft

BetterBASIC has C-like structures. Gather variables of different types into a record and give it a name. Thereafter use only the structure name for file reads and writes, leading to the unmourned demise of FIELD, MKI$, CVD, LSET, etc.

BetterBASIC has "procedures" summoned by name unlike GOSUBs. Best of all, store finished procedures in compiled modules — a single copy to use with any number of future programs.

Lots of features round it out: a built-in linker for compiled modules, a cross-reference command, 32k strings, DOS and BIOS calls, recursion, and an easily used assembly language interface. Ask about these options: 8087 support module, Btrieve interface, run-time module for re-distribution.

Product:	List:	PC Brand:
S1200	$195.00	$169.00

The GSS GRAPHICS SYSTEM

MAJOR!

A Standard Bearer with No True Royalties

Uplifting graphics tools usually come with backbreaking royalties. That's been too heavy a load for limited market or low-priced applications to bear The GSS approach lifts this burden.

The GSS™ series offers a comprehensive set of programming tools adhering to all the major graphic standards. Indeed, its creators sit on a major national standards committee. (Crafty devils.) They know that, more and more, your customers will be concerned for whether you followed standards to obviate obsolescence.

At the heart of the system must be the GSS-Drivers™ package, a library of interfaces between keyboards, mice, joysticks, tablets and printers, plotters, and cameras. It conforms to the proposed ANSI virtual device interface (VDI). Give it a generic request and it copes with the idiosyncracies of the devices.

Then you have a choice of tools. First, VDI "bindings" for C and other languages are libraries of primitives with which your program can build graphic images. Each binding links to Drivers to form a working unit sufficient to produce graphics.

Productivity, though, begins with the GSS-Toolkit™ series. Each — Kernel, Plotting, or Metafile — is a library which wraps the bindings for *all* the supported languages with an envelope of intelligent tools.

Kernel knows how to drive the bindings primitives to draw and color an object, store the sequential instructions, and recreate the object on its own. So powerful, a single command may represent several score lower level statements. It offers all the capabilities of level "2b" of the ANSI Graphical Kernel Systems, (GKS) spec.

Plotting has equivalent tools specializing in graph and chart generation and their captioning. Hand it apples and oranges, say "pie", and it bakes the numbers into a digestible display for screen or plotters.

Kernel and Plotting have tools to convert images they create to virtual device metafiles (VDMs), a tokenized standard for storing graphic images as data. The Metafile Interpreter reads the contents of a VDM and interprets it for re-creation on various devices, and you can cut and paste before display

Quality software? IBM thinks so. They sell the GSS series under their own label.

Now, what about royalties? There are none as such. Buy whichever components you choose. Then, for each which will incorporate into an application, pay a premium — now or later — but only once. Once paid, you are free to create and distribute any number of applications.

Code:	Product:		List Price:	PC Brand:
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GS00C	C Bindings		$150	$129
GS020	Kernel System	256k	$495	$419
GS030	Plotting System	192k	$225	$189
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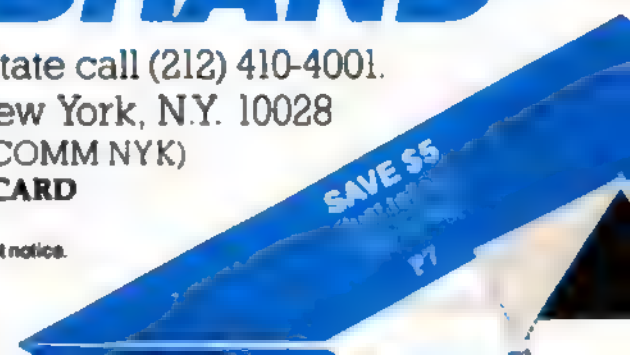
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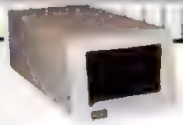
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CIRCLE 102 ON READER SERVICE CARD

PC MAGAZINE

NEWS

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Nonvolatile RAM Boards Keep Data Safe as Disks

PC FIRST LOOK

BY WINN L. ROSCH

Nonvolatility may be the most important recent design innovation in multifunction memory boards. By adding an external power supply and in some cases a battery backup, a trio of new boards—the ABM Computer Systems X2C, the Kapak Novo Drive 1000, and the Tecmar MegaFunction—make their megabyte or more of extra memory invulnerable to accidental power losses. All three serve as RAMdisks; two of the three can also add to or expand on DOS memory.

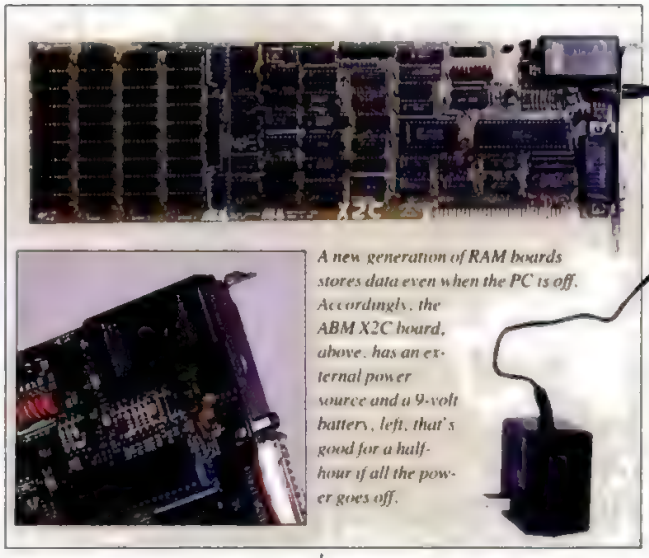
An Ultra-Fast Disk

The memory protection that these boards offer, however, is limited in one key respect: they cannot save data or active programs executing within the normal DOS 640K-byte memory area. If the power goes off suddenly, the effect on the program or data in main memory is still the same—loss of data—despite the addition of the nonvolatile memory board. To solve that problem, you'd need some sort of a backup power supply ($300 and up).

Rather, their nonvolatility is meant to make these disk emulators look like ordinary disk drives to DOS and run about 64 times faster than ordinary floppies. However, unlike the RAMdisks that come with other multifunction boards, these emulators leave the whole 640K-byte DOS memory area available to run programs.

Richard W. Dorman, vice president of marketing for Tecmar, explains, "Although the nonvolatile hard disk emulator we've added to the MegaFunction board is not the only way to increase the functionality of a multifunction board, for some people it can be most effective,

(continued on next page)



A new generation of RAM boards stores data even when the PC is off. Accordingly, the ABM X2C board, above, has an external power source and a 9-volt battery, left, that's good for a half-hour if all the power goes off.

Photograph (ABM X2C): Steve Elmore

Epson on Target With Equity I PC

PC FIRST LOOK

BY BILL HOWARD

Remember Valdocs and the QX-10? That was Epson's first stab at being a rising star in the computer business: a CP/M sort of machine with a nice keyboard and a user-friendly approach that was supposed to treat your valuable documents with kid gloves. Trouble was, the operating system turned out to be 90 percent molasses and 10 percent bugs.

Now, forget Valdocs and think of what Epson could do if it built a computer with all the smarts it puts into its printers.

The second time around, Epson has a hands-down winner with its Equity personal computer. The Equity I, first and simplest in a line that will also include XT and AT compatibles, should put serious competitive pressure on the market leaders: the Tandy 1000 and the machine voted *PC Magazine* Editor's Choice, the Leading Edge Model D ("Cost-Conscious Computing," *PC Magazine*, Volume 4 Number 21).

Competitive Computer

While Epson boasts a $995 list price for its PC compatible, it's really a $1,573 machine by the time you add such necessities as a monochrome monitor, a video display card, and a second floppy disk drive.

At 14 inches across, the Equity is barely wider than its monitor. Such a compact footprint translates into space for only three expansion slots (one

(continued on page 35)



Epson's Equity I joins the Tandy 1000 and Leading Edge Model D as serious players in the low-cost PC-compatible market. A two-drive Equity I system costs about $1,600.

Nonvolatile RAM

(continued from preceding page)

giving a new speed and dimension to handling data."

Despite a similar design philosophy, these three products are quite different. The Novo Drive 1000 is a 1-megabyte RAMdisk for a PC, XT, or AT. The Tecmar MegaFunction and ABM X2C (pronounced "ecstasy") are enhanced multifunction boards with clock, parallel and serial ports, memory, utility software, and RAMdisk capabilities; they will operate in the PC, XT, and compatibles—but not in the AT.

Booting from a RAMdisk

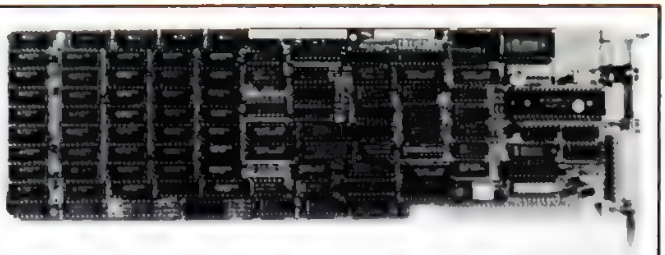
The Tecmar and Kapak RAM boards are Direct Memory Access (DMA) driven, and their RAMdisks are inherently twice as fast as disk emulators residing in the normal DOS memory area. Both boards can boot the system—a quick and eerily quiet operation. If you wish, you can still boot from drive A: or a hard disk.

ABM, a company that has been around for several years as a maker of micro-to-mainframe links, has made the X2C capable of using the Lotus/Intel/Microsoft Expanded Memory Specification (EMS). This memory management system can be used by EMS-compatible programs such as *1-2-3*, Release 2, and/or by the special ABM disk emulator program supplied as a DOS driver on a floppy disk. Although the ABM disk is nonvolatile, it cannot boot the host system. Unlike other disk emulators, the X2C uses an error-correction scheme that prevents single-bit errors from crashing the disk.

As for capacity, Tecmar solders 1.2 megabytes of RAM chips on the main board and allows for a 2-megabyte daughtercard. This memory can be used to backfill a 256K-byte system to 640K, with the rest devoted to the RAMdisk; or all the memory can be devoted to disk.

Kapak's fixed capacity is 1 megabyte soldered in place, devoted exclusively to a RAMdisk.

In an effort to compete with traditional multifunction boards such as the AST SixPak, ABM's socketed-chip design allows the 1-megabyte capacity board to be purchased with as little as 256K bytes of RAM. An optional daughterboard also has a 1-megabyte capacity.



Tecmar's MegaFunction board holds the potential to backfill a typical 256K-byte system to 640K. It has 1.2 megabytes of RAM chips mounted on the main board.

The Tecmar MegaFunction keeps almost all power supply circuitry off the board and relies on a hefty external supply plus an optional hefty external backup battery that's good for about an hour. (An undocumented jumper allows powering the MegaFunction from the host computer's supply, but such operation defeats the nonvolatile aspects of the memory.) Both the Kapak Novo Drive 1000 and ABM X2C keep on-board all the power supply circuitry except for a small, black electronic-calculator-style plug-in transformer. The Novo Drive 1000 on-board batteries are good for 2 hours. The one on the X2C will retain 1 megabyte of memory for half an hour or 2 megabytes for 10 minutes. ABM says you can use just about any external battery of 25 volts or less—such as a car battery—for backup.

Other than their memory nonvolatility, these products rely on mainstream technology. All three use power-hungry NMOS (n-channel metal oxide semiconductor) 256K-bit memory chips. Kapak does cut power consumption with CMOS support chips; Tecmar does likewise with LSI circuits.

How Much Interest?

Despite the allure of nonvolatility, not all manufacturers see the idea as promising.

"We don't have plans for such a product because we haven't seen the need. We do periodic polls on what consumers are interested in and have seen no demand for them," said Robert Kutnick, director of strategic projects, at AST Research in Irvine, Calif. Kutnick believes that today's inexpensive add-in hard disks are a better buy, with more capacity and less worry.

These three products will,

PC MAGAZINE FACT FILE

MegaFunction
Tecmar Inc.
6225 Cochran Rd.
Solon, OH 44139
(216) 349-0600
List Price: 1.2 Mbytes of RAM, $895; 2-Mbyte daughtercard, $795
Requires: 256K motherboard, IBM PC or XT.
In Short: A 1.2- or 3.2-Mbyte multifunction memory board to fill out DOS memory to 640K bytes if desired; unused RAM can be a nonvolatile RAMdisk. Can boot system directly. Does not support the Lotus/Intel/Microsoft Expanded Memory Specification.

X2C
ABM Computer Systems
3 Whatney Dr.
Irvine, CA 92714
(800) 372-8400
(714) 859-6531
List Price: 256K RAM, $395; 1 Mbyte RAM, $572; nonvolatile AC/battery option, $29. Daughtercard without memory, $79; with 1 Mbyte of soldered RAM, $249. Game port, $39.
Requires: 256K motherboard, IBM PC or XT.
In Short: A 256K-byte to 2-Mbyte multifunction board with nonvolatile memory option. Memory not used to fill DOS to 640K or as EMS RAM can be a nonvolatile RAMdisk. Cannot boot system.

Novo Drive 1000
Kapak Design
18784 Cox Ave.
Saratoga, CA 95070
(408) 378-4444
List Price: $395
Requires: IBM PC, XT, or AT.
In Short: A 1-Mbyte, bootable, nonvolatile memory board for use only as a RAMdisk.

NEWS IN BRIEF

New York--Wiring a local area network might become simpler with GCM GridNet from the Danbury, Conn.-based GridComm Inc. The GridNet GC-1400 LAN is designed to connect PCs through standard 120-volt AC wiring; it can support up to eight at a time without speed denigration. Connecting cords that accompany the product are equipped with standard AC outlet plugs on one end and RS-232C connectors on the other.

GridComm plans to ship the $549 GC-1400 in March and is targeting it toward both the IBM and Apple market. An interface device linking the GC-1400-based system to printers, plotters, and other peripherals is available for $449, and a password-protected telephone connector that enables remote communications costs $799.

Paperback Software Inc., manufacturer of VP-Planner ($99.95), a 1-2-3 spreadsheet clone, has noted bugs in its product but has shipped free floppy updates to registered users and plans a more extensive bug fix to be ready 2

however, outperform the fastest Winchester hard disks and will substantially speed up programs that make extensive use of the disk for overlays or that keep only a portion of the data in memory, such as *WordStar*. With their promise of no sacrifice in security and the always-ready convenience of conventional disk drives, they mark the first of a new breed of memory boards. These three may not be the only ones for long.

Low-Cost PC Alternatives

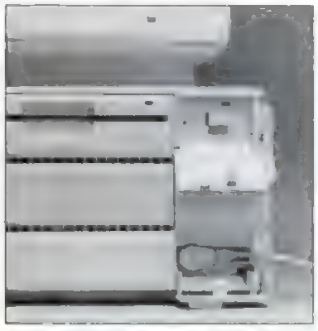
Manufacturer/ model	RAM	Number of serial ports	Clock/ calendar	Expansion slots	Software included	Warranty	Options: Number of floppy disk drives	Options: Video display card	Options: Monochrome monitor	Total price with options
Epson Equity I	256K	1	None	3 full	None	1 year	1	None	None	$995
							2	✓	✓	$1,573
Leading Edge Model D	256K	1	✓	4 full	*Leading Edge Word Processor*	15 months	2	✓	✓	$1,495
Tandy 1000	128K	None	None	3 short	*Desk Mate*	90 days	1	✓	None	$999
							2	✓	✓	$1,589
IBM PC	256K	None	None	4 full 1 short	None	90 days	2	✓	✓	$2,820

All models include MS-DOS, BASIC, keyboard, and parallel port.

Epson Equity I

(continued from page 33)

of which goes for the monitor card) and two disk drives. However, the second drive can be Epson's optional 20-megabyte hard disk. The motherboard holds 256K bytes of RAM. Another 256K can be piggybacked, or you can give over one of the valuable expansion slots to a multifunction card.



Designed for easy access, the Equity I has its power switch, keyboard cable jack, reset button, and DIP switches on the front panel.

The keyboard, somewhat springy and click-free—like a stiffened Compaq keyboard—should appeal to most users. Keys such as Shift, Tab, and Enter have been enlarged, and the pesky Backslash and Tilde keys relocated to the top row.

Front-Panel DIP Switches

Epson loaded the front of the system unit with useful features: the keyboard cable jack, the power switch, all the DIP switches that IBM PC owners must remove the cover to locate, and a reset button to unfreeze hopelessly hung-up programs. Few if any programs written for the PC will hang up because of compatibility problems, however. Everything that PC Magazine Labs tested ran without a hitch on the Equity I.

In the initial PC Magazine Labs tests, the Equity rated 1.0 on *The Norton Utilities* System Information test—the same computing speed as a PC. Disk read/write tests were roughly equal to or modestly quicker than the PC, Tandy, and Leading Edge—about what you'd expect when the label on the front proclaims "Equity."

Useful Setprint Utility

Manuals are first rate, and even a less-experienced user should have no trouble setting up the system. In addition to MS-DOS 2.11 and GWBASIC, two DOS utilities bear special mention: XTREE, a DOS fileminder, and Setprint, which sets up Epson printers (and the dozens of non-Epsons that share Epson control codes) for things such as condensed or italic mode or to skip over perforations when printing unformatted material.



The Equity I, backed by Epson's reputation for quality, is an affordable, reliable PC-compatible.

Whether it's the keyboard cable, the case, or the internal wiring, Epson quality is good enough to get the job done and then some, with one caveat: There's an extra measure of ruggedness and redundancy built into a genuine PC or Compaq that the Epson lacks—as well there should be when you're looking at a sticker price one and a half to two times as much. Still, how often do you hear of an Epson printer failing?

Until something better catches my eye, when someone looking for an inexpensive, reliable PC asks for advice, my answer will be: for valuable documents, it's Epson—finally!

PC MAGAZINE FACT FILE

Equity I
Epson America Inc
2780 Lomita Blvd
Torrance, CA 90505
(213) 539-9140
List Price: With 256K RAM, one floppy disk drive, parallel and serial ports, $995; with two disk drives, monochrome monitor, monitor card, $1,573; 256K RAM card, $169; 20-Mbyte hard disk drive, $1,195, color monitor, $549, color card, $149
In Short: Low-cost, fully compatible IBM computing from a name player in the printer business. But compact footprint means only three expansion slots.

CHRISTOPHER JOHNSTON

months from now.

The Berkeley, Calif. company is also planning a dBASE III workalike database package that will retail for under $100. "This is just another chink in the armor of those who believe users should pay $600 for their software," says spokesman Steve Cook. Paperback President Adam Osborne describes the incipient product as "95 to 98 percent dBASE III-compatible."

A pending lawsuit between Microstuf, Inc., of Roswell, Ga., and SoftKlone Distributing Corp. of Tallahassee, Fla., may help resolve the question of how closely one program can mimic the look and feel of an industry leader. SoftKlone's product, Mirror, is an unabashed Crosstalk XVI knockoff, duplicating its main screen. Microstuf says that SoftKlone's use of the status screen violates copyright law, which gives the copyright owner the exclusive right to reproduce the work in copies. SoftKlone contends that the screen is non-copyrightable.

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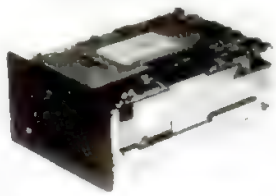
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256K RAM $29

Set of 9 chips
150 Nanoseconds

300/1200 Baud Hayes Compatible Modem Fits in Short Slot



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PC'S LIMITED Six Function Card

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- Game Port



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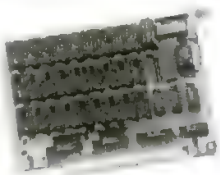


Piggy Back Board $59 w/0K

PC's Limited PC-576 RAM Board W/OK

- Expandable to 576K
- Supports 64K or 256K RAMS
- Fits in Short Slot

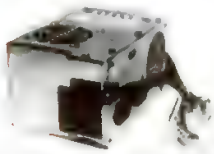
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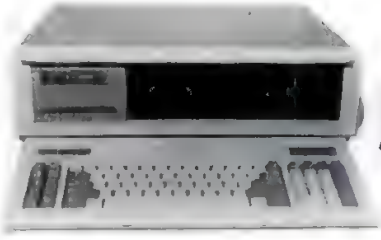


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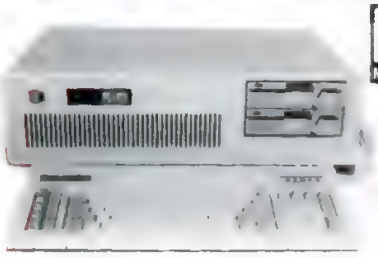
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Runs all Major Software written for the IBM PC® and PC/XT®, 40% faster, without modifications. (Processor) 14-bit 8088-2, 4.77 or 8.66MHZ Clock Speed. (Expansion Slots) 8; 7 are available in above configuration.

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PC MAGAZINE "Editor's Choice" —Feb. 25, 1986

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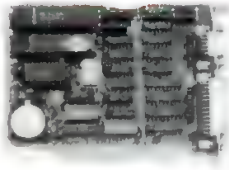
8MHZ Option included at no extra charge.

Includes: 80286-based System Unit, 1024K on Mother Board, 1.2 Meg Floppy Drive, Combined Floppy and Hard Disk Controller Card, AT Keyboard, 192W Power Supply, 2 Serials and 1 Parallel Port, and Clock/Calendar with Battery Backup.

Runs all Major Software written for the IBM PC®, PC XT™, and PC AT™. (Processor) Intel 80286 running at 6MHZ. (Expansion Slots) 8. Same Bus Configuration as IBM PC AT™.

GW Basic $95 • IBM DOS 3.1 $85 • 80287 $195

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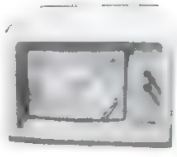


PC'S LIMITED MONO-1 MONITOR $169



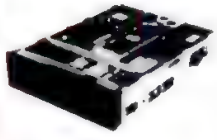
- 12-inch screen
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- 640X200 resolution
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CIRCLE 471 ON READER SERVICE CARD

NEW ON THE MARKET ■ EDITED BY DAVID OBREGÓN

MAXIT 256K-Byte Memory Board

McGraw-Hill Software, a recently formed division of the giant publishing firm, has entered the PC hardware aftermarket with a half-size card called MAXIT that adds 256K bytes of RAM to an IBM PC, XT, or AT—filling out system memory to 640K and beyond for a maximum total of 896K of parity-checked memory. Two software drivers are included. One



McGraw-Hill Software's 256K-byte MAXIT card can create an 896K workspace for programs such as 1-2-3, Release 1A

adds 256K RAM to *1-2-3*, Release 1A, allowing the user to create an 896K worksheet area. In 640K systems, it places RAM-resident software such as *ProKey* or *SideKick* in high-memory space, leaving the lower 640K to programs.

The second driver operates under the Lotus/Intel/Microsoft Expanded Memory Specification for programs such as *1-2-3*, Release 2.0.

List Price: $195. **McGraw-Hill Software**, 8111 LBJ Freeway, #1350, Dallas, TX 75251, (800) 221-8439, (214) 437-7411

CIRCLE **620** ON READER SERVICE CARD

American Computer's American AT

Designed by Chi Yeung, the architect of the erstwhile Eagle PC, American Computer & Peripheral's American AT—an AT-compatible—runs at 6 or 8 MHz and has a BIOS by Award Software. It has eight expansion slots and an AT-style keyboard, with a feel midway between an IBM keyboard and the softer Compaq keyboard.

Although the base unit—with 512K bytes of RAM, a 1.2-megabyte floppy disk, keyboard, and serial and parallel ports—lists for $281 more than a comparably equipped Tandy 3000 AT-compatible and $885 more than a PC's Limited AT, American Computer says dealers have enough margin built in to be price competitive. American aims its AT at value-added resellers that will integrate the machine with software, as well as a retail dealer network.

List Price: $2,880, with 20-Mbyte hard disk, $4,500, with 33-Mbyte hard disk, $4,750, color card, $150, 25-Mbyte tape backup, $750. **American Computer & Peripheral Inc.**, 2720 Croddy Way, Santa Ana, CA 92704; (714) 545-2004

CIRCLE **619** ON READER SERVICE CARD

Elkey Security Board

The Elkey Security Board prevents unauthorized access to data stored on a hard disk, regulating up to 99 users who are given access based on days, times, or filenames. User codes can be changed monthly.

The half-size card contains a clock/calendar and a LOGON/LOGOFF program. The LOGON program is resident on the hard disk and searches for the Elkey card before permitting the system to be used. If the ard is removed, then the data is inaccessible.

The LOGOFF program creates an audit trail of computer use. Manufactured in West Germany by Computer Elektronik Infosys GmbH (founded by ex-IBM staffers), it's distributed in the United States by Trade Ventures International Inc. It carries an 18-month warranty.

List Price: $279. **Trade Ventures International Inc.**, P.O. Box 3235, Reston, VA 22090, (703) 860-3316

CIRCLE **618** ON READER SERVICE CARD

Sybil Disk Utilities Restore Reformatted Hard Disks

The Sybil Disk Utilities provide most of the functions of IBM's *Advanced Diagnostics Disk*, adding the ability to recover data from a hard disk that has been accidentally reformatted. *The Sybil Disk Utilities* can also test systems boards, memory, keyboards, I/O ports, and video attributes. Files can be selectively unerased, disks can be edited by sector, and file and directory attributes can be modified. *The Sybil Disk Utilities* includes a print spooler, a RAMdisk, an expression parser, and a graphics editor compatible with either the IBM Color/Graphics or Monochrome adapters.

List Price: $49.95. **Requires:** 128K RAM, one disk drive, DOS 2.0 or later. **Sophco Inc.**, P.O. Box 7430, Boulder, CO 80306, (800) 922-3001, (303) 444-1542

CIRCLE **617** ON READER SERVICE CARD

Charts Unlimited

Using the same command structure as *1-2-3*, Graphware Inc.'s *Charts Unlimited* graphics/text processing package treats flow charts, organization charts, architectural and engineering diagrams, Gantt charts, and similar graphics as one large worksheet with 256 columns and up to 1,000 rows. This represents a graphics area of over 12 million pixels; although only a part of the entire worksheet is visible at one time, an added feature allows the user to shrink the worksheet to one-eighth its regular size for display, as well as move

(continued on page 44)

HOT PROSPECT

Sysdyne Portable Hard Drives: Lock Them Up or Take Them with You

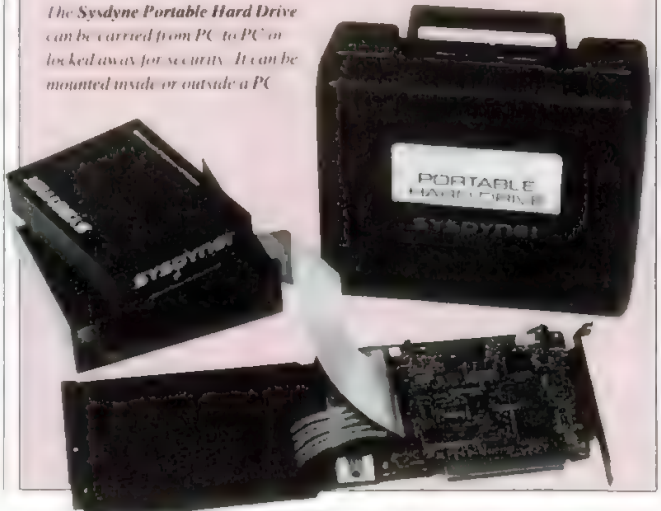
The Sysdyne Portable Hard Drive (PHD) is a compact hard disk small enough to fit an expansion slot with an optional docking port; however, it is primarily intended to be used with a mounting bracket either outside a systems unit or installed in place of an internal half-height drive. These latter configurations permit the 10-megabyte drive to be used with more than one bracket-equipped PC or to be locked away for security.

A separate controller board and an external mounting bracket or internal docking port are required for each PC to which the PHD is to be connected. It's marketed by the ComputerLand chain.

List Price: Hard disk, $779, controller card, $269, docking port or mounting bracket, $45. **Sysdyne Products Div.**, 2955 Peralta Oaks Ct., Oakland, CA 94604, (415) 562-1704

CIRCLE **621** ON READER SERVICE CARD

The Sysdyne Portable Hard Drive can be carried from PC to PC or locked away for security. It can be mounted inside or outside a PC



This Little Fella Means Business.

The Mouse by Maynard Electronics makes your favorite programs faster, easier, and smarter!

Mouse
BY MAYNARD ELECTRONICS





Teach The Mouse To Type.

A single Mouse click will instantly produce the character, sentence, paragraph, or anything else you've selected. **Click:** you call up the CustomKey menu. **Click:** your file is saved. **Click:** a commonly used paragraph appears in place. No other mouse gives you such power and versatility.

At last, an "intelligent" mouse! Now you can add command power to your programs, when you want, the way you want — instantly! The Mouse by Maynard Electronics comes with our CustomKey™ software which lets you assign and reassign commands **while using your favorite programs — even those without mouse utilities.** Fly through programs like Symphony,* Lotus 1-2-3,* Framework,* MultiMate,* and others with undreamed of speed! And of course, it's fully compatible with all programs written for a mouse, too.

A Tale Of Three Mice . . .

Compare our Mouse with the others running around and you'll see, there's no comparison! Here are just a few features across the board:

FEATURES	Maynard Mouse	Microsoft	Mouse Systems
# of Button Combinations	7	3	5
Button Auto Repeat	Yes	No	No
Diagnostics	Yes	No	Yes
Dynamic Scaling	Yes	No	No
Cursor Overshoot Control	Yes	No	No
Adjustable Cursor Speed/Up, Dn (while running application)	Yes	No	No
Adjustable Cursor Speed/Rt, Lft (while running application)	Yes	No	No
Buttons-Definable (while running application)	Yes	No	No
Macros-Definable (while running application)	Yes	No	No
User-Definable Alternate Cursor Movement	Yes	No	No

Free Drawing!

Purchase The Mouse now and receive the popular paint program Telepaint* at no additional cost — a $149 value!



*Symphony and Lotus 1-2-3 are trademarks of Lotus Development Corporation. Framework is a trademark of Ashton-Tate. MultiMate is a trademark of SoftWord Systems Inc. Telepaint is a trademark of LCS/Telegraphics.

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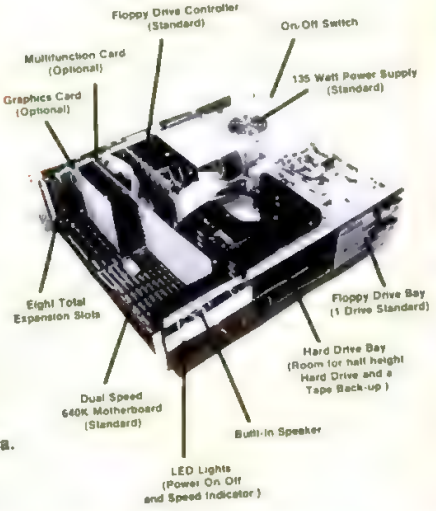
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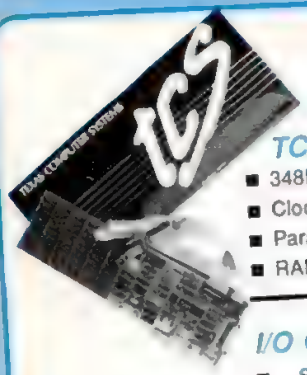
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- Fits 5 inch short slot on IBM-XT
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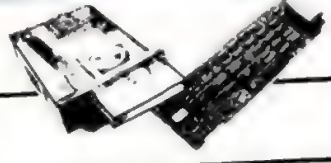
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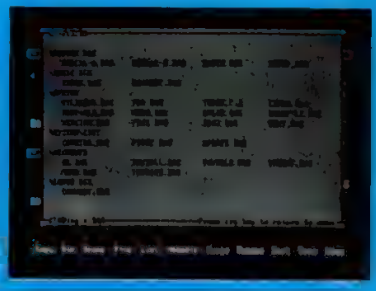
Order Toll Free 1-800-433-5355

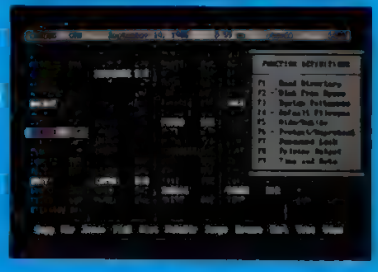
For Software Orders Only

Pop-up windows give you instant access to many enhanced DOS functions from inside the program you are running.

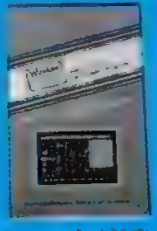
And then return you instantly to where you started.

- Quickly search for any file, any time.
- See up to 85 files per screen page.
- Check space left on your disk while running a program.
- Never again have a DIR command scroll files off your screen.
- Easily copy, erase or rename files.
- Send printer codes from within program you are using.
- Password lock your computer.
- And much more!





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– Paul Bonner, Reviewer, PC Week



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Compare WindowDOS with its competition in these 20 important categories!

	WindowDOS	SideKick	1 Dir	XTREE	Starbridge DOS	Norton Utilities
Works inside another program	Yes	Yes	No	No	No	No
Display Directory	Yes	Yes	Yes	Yes	Yes	Yes
Sort Directory	Yes	No	Yes	Yes	Yes	Yes
Find any file on hard disk	Yes	No	No	No	No	Yes
Copy, erase or rename file	Yes	No	Yes	Yes	Yes	No
Selective file erase command	Yes	No	No	Yes	Yes	No
Batch file copy or erase	Yes	No	Yes	Yes	No	Yes
Change file attributes	Yes	No	No	Yes	Yes	Yes
Change default subdirectory	Yes	No	Yes	Yes	Yes	Yes
Create new subdirectories	Yes	No	No	Yes	No	No
Display visual TREE	Yes	No	Yes	Yes	Yes	Yes
Check free space on drive	Yes	No	Yes	Yes	Yes	Yes
Display file in ASCII format	Yes	No	No	Yes	No	Yes
Display file in HEX format	Yes	No	Yes	No	No	No
Check or set time and date	Yes	No	No	No	No	No
Send printer control codes	Yes	No	No	No	No	No
Select default printer	Yes	No	No	No	No	No
Password lock computer	Yes	No	Yes	No	No	No
Screen timeout feature	Yes	Yes	No	No	No	No
Windows						
Copy protected	No	No	No	No	Yes	No
Cost	$49.95	$84.95	$95	$49.95	$49.95	$99.95

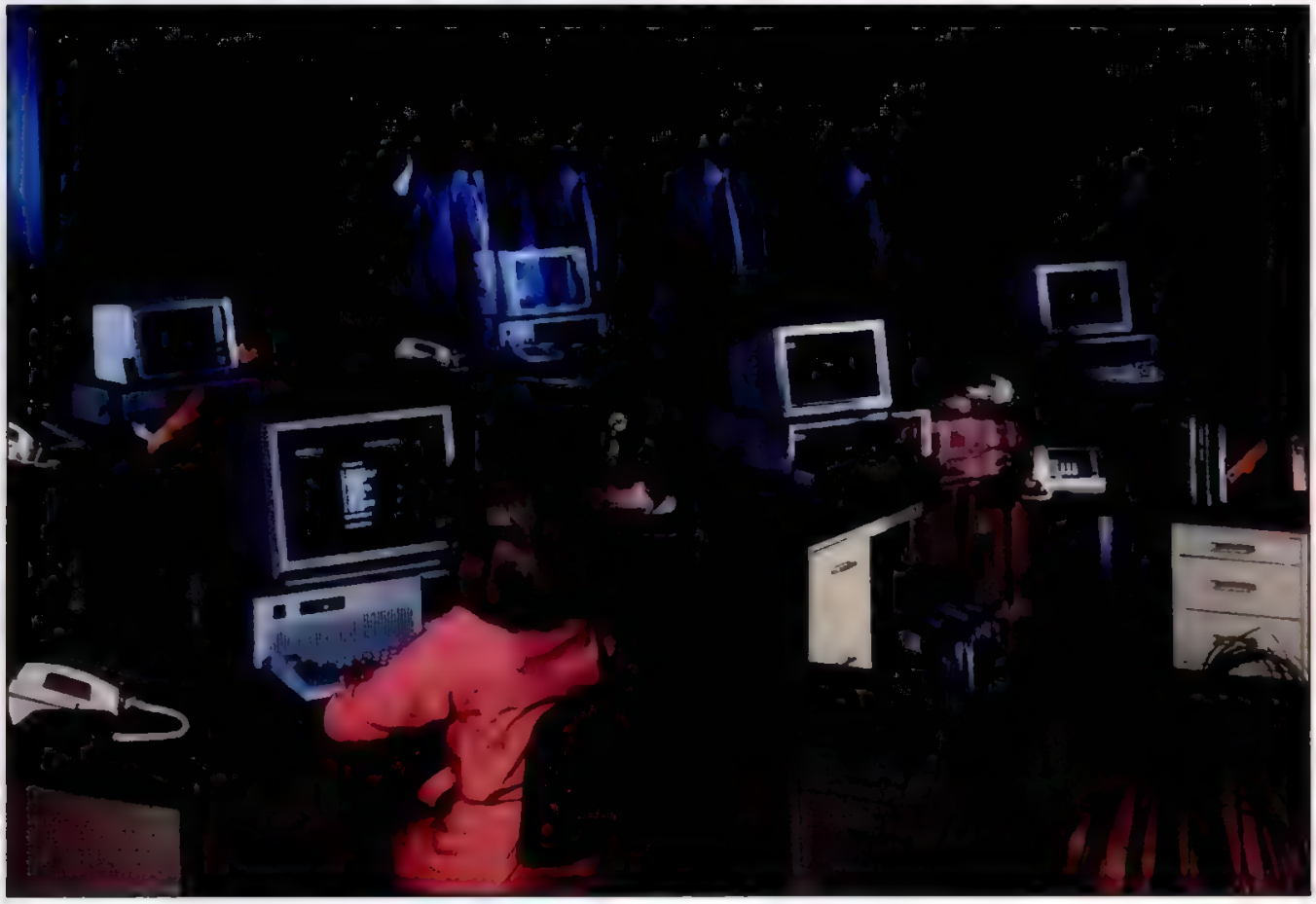
Memory resident The feature is available from inside another program

What SideKick doesn't do, WindowDOS does. They work together as perfect companions. No other utility can compare with the many fine features found in WindowDOS!

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For the IBM Personal Computer. Requires 128K RAM, two disk drives, PC-DOS, Asynchronous Communications interface or equivalent RS232 connection, and a modem compatible with the "AT" command set. TRANSPORTER, CROSSTALK and MICROSTUF are registered trademarks of Microstuf, Inc., IBM is a registered trademark of International Business Machines Corp.

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the Database + Integrated Accounting

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Compare TAS with DBase III and RBase 5000. You'll see why we think TAS is the best "Hard-nosed" value around. TAS includes a data dictionary. TAS includes a true procedural language. TAS includes a run-time compiler. Plus TAS can be upgraded to multi-user for $100.

TAS lets you develop your own professional menu-driven business applications. And not just simple ones either. TAS applications can hold up to 17 million records. And because TAS compiles them, they run fast.

	TAS™	DBASE III	RBASE 5000
Multi-User	$100	No	$1400
Data Dictionary	Yes	No	Yes
Procedural Language	Yes	Yes	Yes
Compiler	Yes	No	Yes
Records Per File	Unlimited	Unlimited	Unlimited
Files Open	16	10	40
Fields Per File	Unlimited	128	400
File Size	Unlimited	Unlimited	Unlimited
Record Size	10,254	4,000	1,530
Field Size	254	254	1,530
Prices	$199	$696	$700

And TAS is no new comer. TAS was written by Phil Mickelson, the same "Hard-nosed" business person who created The Sensible Solution™ (relational database) in 1982.

TAS comes with a 30 day money back guarantee (less handling fee of $15 Level 1, $30 Level 2, $45 Level 3 and $10 Multi-User). TAS is available for the IBM PC/XT/AT,™ Compaq,™ AT&T 6300,™ Tandy 1000, 1200, 2000™ and most MS-DOS,™ CP/M™ and MP/M™ systems. Multi-user and LAN versions also available.

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But why stop with just a database? For just $349, you get TAS Relational Database/Language plus General Ledger, Accounts Receivable and Accounts Payable. And for $499 you get all the above plus Inventory, Sales Order Entry, Purchase Order Entry, and Payroll.

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☐ 8 bit — CP/M, MP/M, TurboDOS

☐ 16 bit — MS-DOS, PC-DOS

Disk size is:

☐ 5¼" ☐ 8"

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___ Level 3 Accounting (Level 2, SO, PO, INV, PR)–$499

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New on the Market

(continued from page 38)

quickly to any desired location of an image.

Charts Unlimited also allows text to be added directly from the keyboard or imported from external text files.

List Price: $295. **Requires:** 256K RAM, one disk drive, color/graphics adapter, DOS 2.0 or later. **Graphware Inc.**, P.O. Box 373, Middletown, OH 45042; (513) 424-6733.

CIRCLE **616** ON READER SERVICE CARD

TophAT Memory for PC AT

Boca Research Inc., a firm established by the founder of Quadram Corp., has produced a high-speed memory board for the IBM AT that fills out system memory to the DOS 3.0 limit of 640K bytes. The TophAT board is available with 128K for the enhanced AT that has 512K RAM on the motherboard or with 384K RAM for the AT with 256K RAM. The boards work with ATs and compatibles running at 6- or 8-MHz clock rates.

Designed to operate as normal system memory only, the TophAT board can coreside with memory boards operating under the AT's extended memory specifications. The memory is made available to the system using IBM's own *AT Diagnostics Setup* program.

List Price: 128K board with 64K chips, $145; 384K version with 256K chips, $195. **Boca Research Inc.**, 6401 Congress Ave., Boca Raton, FL 33431; (305) 997-6227.

CIRCLE **615** ON READER SERVICE CARD

Webster's New World On-Line Thesaurus

Simon & Schuster Computer Software has based its RAM-resident synonym-finder on *Webster's New World Thesaurus;* it contains more than 100,000 synonyms. Users can look up synonyms for synonyms, view two separate listings of synonyms simultaneously, restore original word choices instantly, store word selections for later reference, and scroll through the thesaurus at will.

Webster's New World On-Line Thesaurus works with *WordStar*, *MultiMate*, *WordPerfect*, and 22 other word processors, as well as EDLIN, *Framework*, *Symphony*, *SideKick*, *ThinkTank*, and *Word Proof*.

List Price: $69.95. **Requires:** 128K RAM, one disk drive, DOS 2.0 or later. **Simon & Schuster Computer Software**, 1230 Avenue of the Americas, New York, NY 10020; (212) 245-6400.

CIRCLE **614** ON READER SERVICE CARD

Random House Reference Set Challenges Lightning

Reference Software is challenging Borland International's *Turbo Lightning* software with Version 2.0 of its *Random House Reference Set*, a RAM-resident utility placing the 83,000-word *Random House Dictionary* and the 50,000-synonym *Random House Thesaurus* in system memory for instant access. In its comparisons to *Turbo Lightning*, Reference Software claims its software takes up less memory space (25K bytes versus 79K), displays more words on-screen at one time (55 versus 15 words), and offers a macro function that allows users to store frequently needed words in easily accessed personal glossaries.

The *Random House Reference Set* can run a document through its spelling checker in one pass and allows the cross-referencing of synonyms within its thesaurus. Additionally, the software can work with 17 different word processors, as compared with only four for *Turbo Lightning*. The *Random House Reference Set* is not copy protected and will coreside in memory with other RAM-resident utilities.



The **Random House Reference Set** *combines the* Random House Dictionary *and* Thesaurus *into one, complete RAM-resident utility.*

List Price: Combined reference set, $89; dictionary or thesaurus only, $69 each. **Requires:** 128K RAM, two disk drives, DOS 2.0 or later. **Reference Software**, 2363 Boulevard Cir., Walnut Creek, CA 94595; (800) 826-2222, (415) 947-1000.

CIRCLE **612** ON READER SERVICE CARD

VoiceWare Voice Input/Output Modules

Building upon the technology developed by Votan for its advanced VPC2000 voice-recognition board, VoiceWare Inc. has introduced vocal interfaces to *dBASE III*-based data files, as well as a multiuser message storage and retrieval system using *dBASE III* as a data-storage vehicle. VoiceWare's *Mobile Manager* and *Data Manager* modules permit the user to enter and retrieve data from *dBASE III* files using either a microphone or a telephone. The *Message Manager* module incorporates a multiuser voice store-and-forward system, recording incoming messages for later retrieval by the correct party. The *Personal Productivity Manager* has such features as a voice tickler file, a time-and-date manager, a voice scratch pad, automatic dialing, voice computer control, voice data entry and retrieval, and more.

A user first creates a voice template of commands the system should recognize. Voice commands can be tailored to each user's specific requirements and can replace keyboard commands with spoken words. The modules are designed for the IBM PC-XT and compatibles and require a hard disk. The basic system consists of a Votan VPC2000 voice-recognition board, a VoiceWare Operating System, a hand-held microphone, and a speaker with adjustable volume control.

List Price: Basic system and individual module, $4,495 to $4,995; additional modules, $1,295. **Requires:** 640K RAM, one disk drive, *dBASE III*, IBM PC-XT, DOS 2.0 or later. **VoiceWare Inc.**, 551 Pilgrim Dr., Foster City, CA 94404; (415) 572-7997.

CIRCLE **613** ON READER SERVICE CARD

Transpac Portable Hard Disk: Secure Storage

The Transpac portable hard disk, a 3½-inch Winchester from Microcomputer Memories Inc., is designed to fit an expansion slot within a PC and allegedly is rugged enough to be removed as needed for security or for use with different computers. The Transpac is available in 10- or 20-megabyte storage capacities and is sized to fit the short slot in the XT or Portable PC (though its width overlaps a second slot as well). A soft carrying case is included.



The **Transpac** *portable hard disk can be easily unplugged and reattached to a PC expansion slot.*

List Price: 10 Mbytes, $1,095; 20 Mbytes, $1,295. **Microcomputer Memories Inc.**, 9340 Owensmouth Ave., Chatsworth, CA 91311; (818) 700-8000.

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SixPak Plus, 384K, S/P/CC	$895	$269
Advantage Multif Brd for AT	$595	$425
Rampage 256K for PC	$495	$395
Rampage 128K for AT	$745	$495
CENTRAL POINT		
PC Option Board	$ 95	$ 81
COMX		
130 Watt Power Supply	$179	$ 93
CORE Hard Disks for AT		
ATplus 20 meg for AT	$1595	$1355
ATplus 30 meg for AT	$1995	$1695
ATplus 56 meg for AT	$3595	$3195
HAUPPAGE (HCW)		
8087 Chip	$175	$119
80287-2 Chip	$225	$175
80287 Fast-5 Chip	$295	$229
HERCULES		
Color Card with Parallel Port	$245	$185
Mono Graphics Card	$499	$319
INTEL		
Above Board 64K for PC	$395	$299
Above Board 128K for AT	$595	$449
KENSINGTON		
Masterpiece Plus	$180	$129
KEYTRONIC Keyboards		
KB5151 or KB5151 Jr.	$255	$189
MICROSOFT		
Mouse	$195	$125
MOUNTAIN		
20 meg DriveCard	$1195	$945
MOUSE SYSTEMS		
PC Mouse with Paint	$220	$145
Mouse with Software (Jr)	$220	$139
PERSYST		
PC Mono Board w/Par Port	$250	$159
Color Board	$210	$139
QUADRAM		
Quadboard no RAM to 384K	$295	$189
Quadboard 384K S/P/CC/G	$795	$239
EGA+ Board	$595	$425
RACORE		
Expansion Chassis Plus (Jr)	$675	$459
256K Expansion Board (Jr)	$275	$179
TALLTREE		
JRAM II board	$219	$159
JRAM III 256K Board	$399	$249
TITAN		
PC Accelerator 128K	$795	$595
VIDEO 7		
Mono Graphics Card	$250	$139
MGC with Parallel Port	$300	$169
VEGA Board IBM EGA Comp.	$599	$429
WESTERN DIGITAL		
10 meg Filecard Hard Disk	$895	$695

PRINTERS

BROTHER		
HR25 Daisywheel	$695	CALL
EPSON		
LX80 100 cps, 16 cps NLQ	$299	$249
FX286 200 cps, 40 NLQ	$749	$609
LQ800 180 cps, 60 LQ	$799	$649
LQ1000 180 cps, 60 LQ, 15"	$995	$795
LQ1500 200 cps, 67 LQ, 15"	$1295	$995

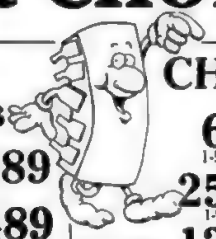
DISKETTES

CONROY-LAPOINTE DISKETTES	
10 ea DS/DD 40 trk (IBM)	$ 16
100/1000 ea DS/DD 40 trk	$119/799
10 ea DS/HD 96 TPI (IBM-AT)	$ 29
100 ea DS/HD 96 TPI (IBM-AT)	$269
GENERIK	
10/100 DS/DD 40 trk (IBM)	$ 10/ 79
10/100 DS/HD 96 TPI (AT)	$ 27/249

IBM SOFTWARE

	List	Ours
ASHTON-TATE		
Framework II	$695	$415
dBase III+	$695	$395
dBase II (req. PC DOS & 128K)	$495	$305
BORLAND		
Traveling Sidekick	$ 70	$ 39
Editor Toolbox or GameWorks	$ 65	$ 40
Turbo New Pack	$ 95	$ 50
Reflex: The Analyst	$ 99	$ 59
Traveling Combo	$125	$ 65
Turbo Holiday Pack	$125	$ 69
Superkey/Sidekick Package	$125	$ 75
Turbo Jumbo Pack	$245	$130
BOURBAKI		
1 dir	$ 95	$ 62
CENTRAL POINT		
Copy II PC or PC Tools	$ 40	$ 22
CHIP SOFT		
Turbo Tax	$ 65	$ 45
CYGNET		
The Little Black Book	$ 50	$ 39
DAC		
Easy Accounting	$ 70	$ 55
FIFTH GENERATION		
Fastback	$179	$109
FUNK SOFTWARE		
Sideways NEW VERSION!	$ 60	$ 39
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WordStar 2000 Plus	$595	$295
MICRORIM		
R:Base 5000	$695	$385
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R:Base Clout	$249	$133
Program Interface	$395	$225
MICROSOFT		
Flight Simulator	$ 50	$ 33
Windows	$ 95	$ 63
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Macro Assembler	$150	$ 99
Multiplan	$195	$124
Access	$250	$169
Word	$375	$239
MICROSTUF		
Crosstalk XVI	$190	$110
Remote	$195	$110
MULTIMATE		
Multimate	$495	$229
Advantage requires 384K	$595	$295
PAPERBACK		
VP Planner	$100	$ 65
PETER NORTON		
Norton Utilities	$100	$ 56
POLYTRON		
Polywindows (copiable)	$ 85	$ 45
ROSESOFT		
Prokey	$130	$ 80
SATELLITE (SSI)		
WordPerfect NEW VERSION!	$495	$229
SOFTWARE PUBLISHING		
PFS: Write, File or Graph	$140	$ 84
SYMATEC		
Q & A	$299	$219

Internal Hard Drives



10 meg with controller List $745 **$389**

20 meg with controller List $895 **$489**

90 day limited warranty

CHIP KITS

90 day limited warranty

64K $ 9 1-99 sets $11 100+ sets

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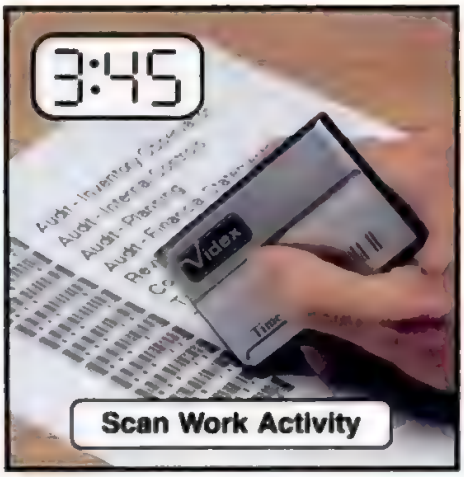
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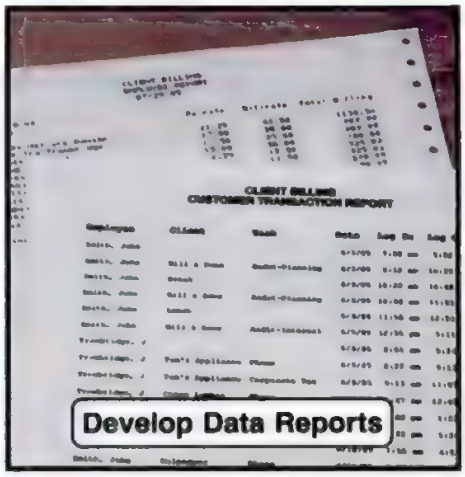












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■ **FROM THE EDITOR'S SCREEN** ■ BILL MACHRONE

MAKING MONEY WITH LOW RISC



Spelled risk or RISC, this word is at the heart of this issue on investment software. Here's the lowdown on the hottest IBM product news to date: the RISC computer, called the RT PC.

This issue is dedicated to the proposition that your PC can help you or your company do things faster or better—things that will make money. The stock market is at once a science and a gamble. When you analyze instead of playing hunches and following the indexes, you're making it a little more of the former and a little less of the latter.

UNFAIR ADVANTAGE I'm reminded of the late, great race car driver Mark Donohue. Beyond his great driving skills, he was also an engineer. He always searched for the unfair advantage, the edge that would put him far enough ahead of his competition that he could use his skills to the best advantage. He reasoned that the more even the weight distribution was among the car's four wheels, the better the car would handle. Lacking any sophisticated means of weighing a car one wheel at a time, he put bathroom scales under each wheel, then added up their readings. This data allowed him to make his car faster—the unfair advantage.

The analysis and evaluation programs we review in this issue can give you a similar edge. Obviously, though, you have to know what to do with the information before you can make sound decisions. For that, the PC helps in other ways. Simulation programs and stock market "games" are realistic ways to hone your trading skills without losing your shirt. The PC's communications skills also work to your advantage, as you tap into the plethora of information about stock trading.

Indeed, the only thing standing between you and the information available to professional traders is the depth of your pockets. The stakes are as high as you want to raise them. You can get information onto your screen via phone line, FM subcarrier, or even satellite dish. You can get it daily, hourly, or up to the minute.

No amount of scientific analysis will ever make trading totally rational. After all, the person selling is as firmly convinced that the price is going down as you are that it is going up. There is a faint resemblance to the life insurance equation in which the company is betting that you're not going to die while you bet that you will. Not that trading or life insurance is foolhardy; "prudent risk" has been essential to human endeavor from the start.

PRUDENT RISC? Which brings us to a completely different kind of RISC, the reduced instruction set computer. As everyone knows, IBM has introduced a RISC-based member of the PC family. In some ways, it's a distant relative, given that it didn't come out of the Entry Systems Division. However, it does run PC-DOS.



Illustration: Warren Gebert

The biggest question surrounding the RT PC is "Why?" IBM is entering two subsets of the same market with a machine that is not necessarily superior to its competition. Can IBM's traditional marketing muscle turn the tide? The engineering and technical professional market is a tough one: Engineers read the specs.

The RT PC runs an IBM-ized UNIX. UNIX has become the de facto operating system for the scientific side, from individual workstations through Cray supercomputers. The RT has a variety of monochrome monitors available. Only the larger, 15-inch model is interesting. The smaller one, while sporting all-points-addressable graphics, appears fairly useless as anything but a system console when the RT is configured in multiuser mode.

As a multiuser machine, the RT appears to be outclassed by much of its competition. It currently supports only eight users, which places it smack in the middle of some less-expensive machines that handle as many or more users, such as the NCR Tower and Altos 286. Just a little bit upscale lurks DEC's formidable MicroVAX II. Hewlett-Packard's aging but still-capable 3000 line shows that 16-bit processors still have a claim on the multiuser market, especially when they are supported by one of the most elegant operating systems to be found anywhere: MPE.

The RT's RISC processor is supposed to make the entire machine faster by exe-



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CIRCLE 247 ON READER SERVICE CARD

■ FROM THE EDITOR'S SCREEN

cuting the most common instructions as quickly as possible, ideally in one tick of the processor's clock. While the RT does in fact do this, the results are not that fantastic. It's incredibly hard to measure the absolute performance of one computer over another, given the vagaries of attached devices, operating systems, and so forth, but I don't see that the RT has any clear advantage over systems built around other 32-bit processors, such as Motorola's 68020, National's 32032, or Intel's forthcoming 80386. These processors run at very high clock rates, with cycle times below that of the RT's RISC. When you execute longer instructions faster, you come out the same.

Of course, IBM will follow its traditional path with the RT: faster processors, more memory options, coprocessors, port expansion, the works. You have only to watch the maturation path of any of IBM's key machines, such as System/36 or the 4300 series, to see what lies ahead.

The RT PC's role in the workstation marketplace is interesting and worthy of speculation. Workstations are typically standalone 16- or 32-bit minicomputers with links to a mainframe or supermini. Workstations have large graphics screens that can be divided into multiple windows or tasks. Scientific and professional users apply them to a wide variety of design and analytical applications. DOS-meets-workstation is a growing trend, in which DOS can run in one or more of the windows. The RT doesn't run multiple copies of DOS, just one from the system console. Worse, not all of its fancy new displays work with DOS. Fortunately, the RT allows multiple virtual consoles, so you can switch from a design screen to a DOS spreadsheet and back again, all from the same keyboard. The RT does, however, sport a DOS-like shell for UNIX, so you can type the familiar "DIR" instead of the more cryptic "ls −l."

Of course, you can run PCs as the user terminals on any multiuser system. You gain the power of individual DOS sessions but lose the fancy graphic programs that run under UNIX. And IBM's magnificent 5080 full-color CAD workstation needs an entire RT PC to run it. You network 5080s with a mainframe.

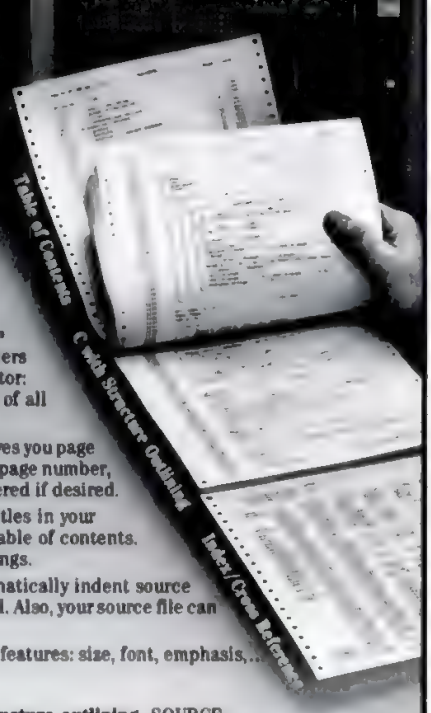
Still, IBM has a shot at the brass ring with the RT PC. If conventional wisdom holds, the engineers will hate the specs, but the boss will buy IBM. My guess is that the RT will get off to a slow start, then build dramatically as IBM adds performance and features. Technical users have a lot more control over their destiny than their less-computer-savvy counterparts on the business side. IBM's going to have to measure up to their specs.

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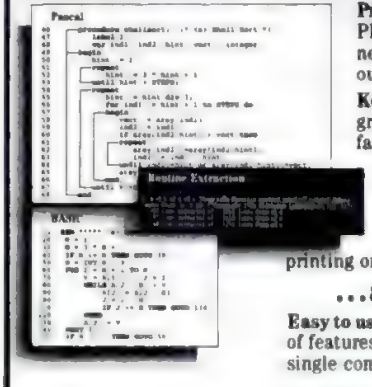
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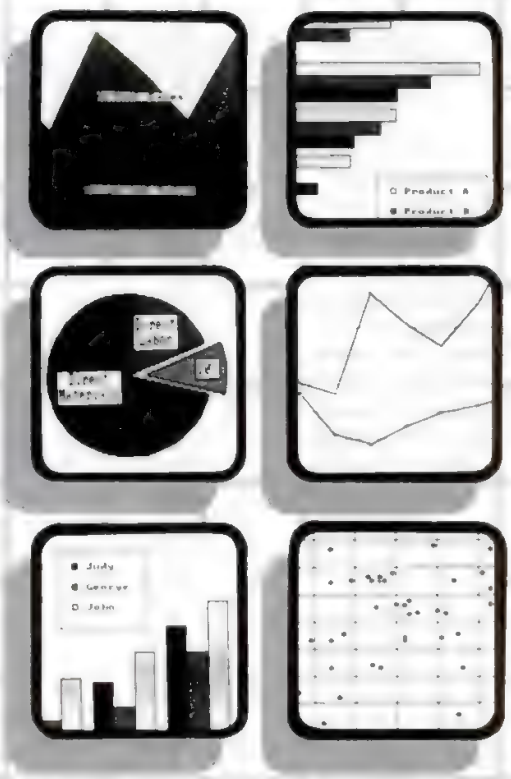
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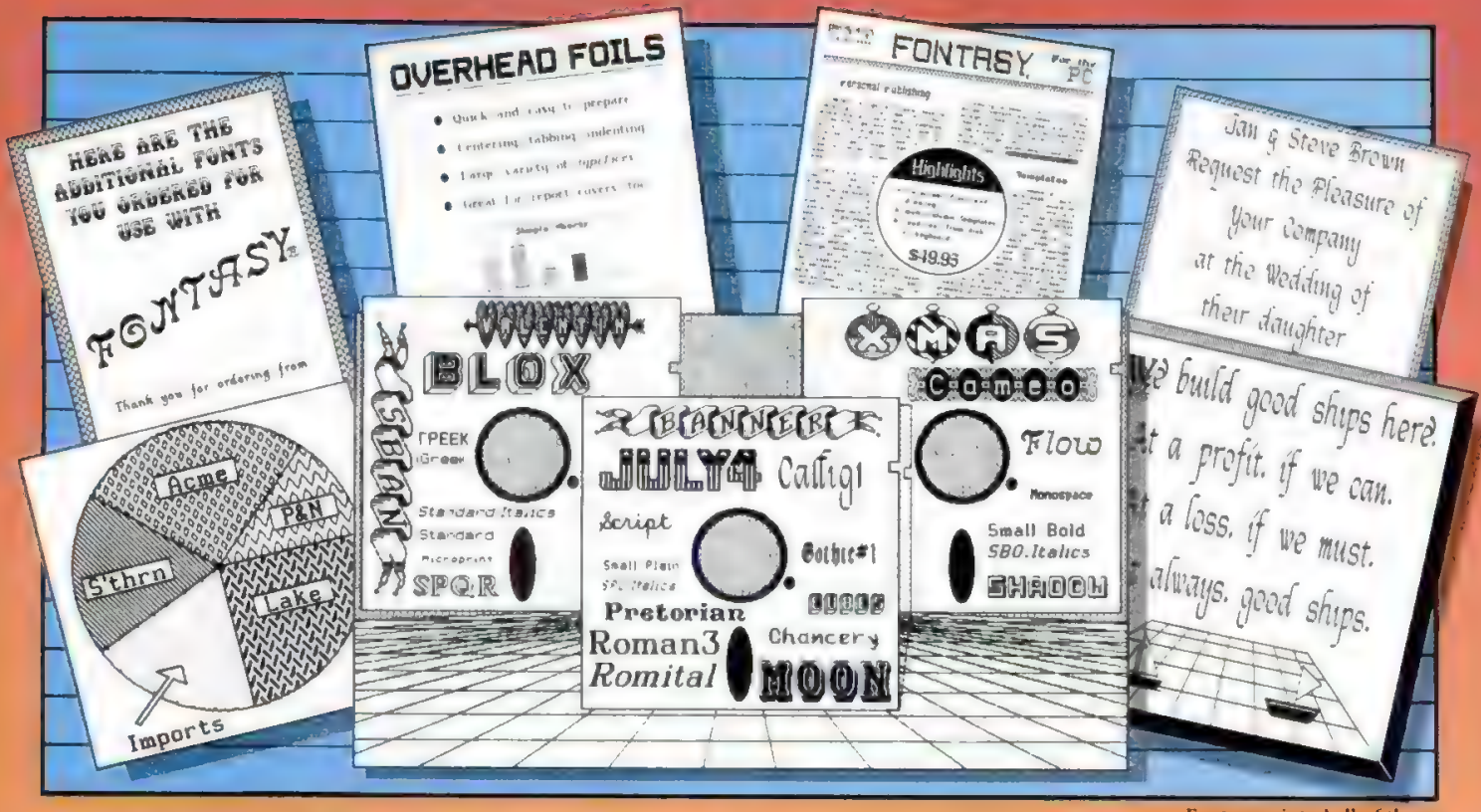
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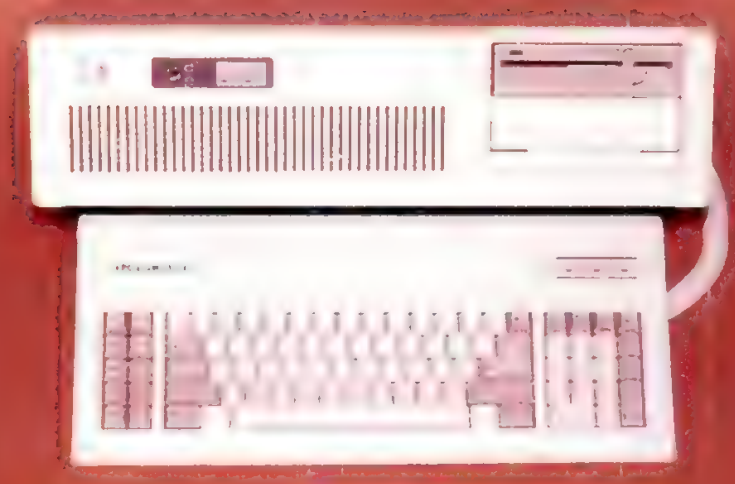
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■ PETER NORTON

RECOVERING DATA FROM CROSS-LINKED FILES



If two or more files' allocation chains converge on the same file allocation table (FAT) entry, then the disk is in trouble. Norton explains how to recover data from these messed-up files.

After a brief detour, I'm back to exploring the mysterious things that can go wrong with disks, how you find out about these problems, and what you can do about them. I've been focusing on the disk problems that are diagnosed by the DOS utility program CHKDSK.

CHKDSK tests your disks for what I call logical damage, meaning any sort of mix-up in the data structure of the disk, the directory entries, or the space pointers that record what's on the disk and where it's kept. CHKDSK doesn't test for physical damage (such as whether or not any parts of the disk are unreadable); other programs do that kind of testing, including DOS's FORMAT (a destructive test, because it overwrites all your data), Disk Test (part of *The Norton Utilities*), and DFixer (reported to be the most thorough disk tester of all).

In my last column on this topic, I discussed the most innocuous error that CHKDSK can detect: so-called "lost," or orphaned, clusters. Lost clusters are usually harmless and are easy and safe to repair; I also explained how they manage to get lost in the first place.

CROSS-LINKED FILES Unfortunately, the other problems that CHKDSK reports are much nastier than orphaned clusters. Probably the meanest of all is cross-linked files.

As I've discussed many times, DOS keeps track of the working space on a disk through a table called the file allocation table (FAT). Each table entry in the FAT corresponds to a chunk of storage space on the disk. If the FAT entry has a zero in it, the corresponding cluster of space is free and available for use. A nonzero entry means the space is in use and the number that appears in the table is a "pointer" that chains together a file's data. The process works like this: Each file's directory entry indicates the FAT number of the first part of the file's data; the number stored in that FAT entry points to the next part of the file, and so on, in a series of links that locate each cluster of data in the file. At the end of this space allocation chain is a special number that means "that's all folks"—we've come to the end of the file.

CHKDSK's primary task is to test that all these pointer links in the FAT are doing their job correctly. Each file's chain of FAT entries should be unique. However, it is possible for two allocation chains to converge on the same FAT entry, creating a confusing cross link.

To test for this, CHKDSK traces every file on your disk, and during the process, it notes which FAT entries have already been traced. If CHKDSK discovers a file with a FAT entry that has already been marked, it knows that two (or more) files are cross-linked—their allocation chains converge onto the same FAT entry. That's never supposed to happen. Therefore, when it does, you know that your disk is in trouble.



The degree of trouble depends on how many cross links CHKDSK finds. Usually it will find either two or loads of cross links. If CHKDSK reports the latter, you can be sure that the disk is thoroughly scrambled and there is little point in trying to do any repair work.

WHEN RECOVERY IS POSSIBLE If CHKDSK reports just two cross-linked files, there is, of course, a possibility that both files are messed up. But chances are good that you can recover all the data from one of them and, perhaps, part of the data from the other. If one file is in good shape, however, the other is almost guaranteed to be messed up. This is because the file with the good file allocation chains will copy out the right data for that file; the other file's chain, though, may copy out some of the right data for that file and then lead into the other file's data.

Although you can't be sure right off the bat which of the two files is good, it's a good guess that the older one of the two—the one whose directory entry shows an earlier date and time—is the one that's intact. But you don't need to rely on intelligent guesses.

Illustration: Warren Gebert

■ PETER NORTON

To find out which of your files are messed up, all you have to do is make copies of the files you are checking onto another disk, using the DOS COPY command. (Of course, don't make the copies onto the same disk—because, for the moment, that particular disk is suspect.) Once the copies are made, you can call up the files and check to see if they contain what they should.

RECOVERING YOUR DATA You don't necessarily have to throw away any messed up files. As I've commented in previous columns about the process of "unerasing" data, some files are an all-or-nothing proposition—unless you get 100 percent of exactly the right data in exactly the right order, you can't use it. This is true of highly structured data, such as spreadsheet files, database files, and also program files (files with an extension name of .COM or .EXE).

On the other hand, you can salvage and use data that is relatively unstructured, particularly plain ASCII text files and many word processing files. If your data is of the forgiving variety, you may be able to use the fragment of original data that might appear at the beginning of one of the two cross-linked files.

■ If CHKDSK reports just two cross-linked files, chances are good you can recover all the data from one of them.

SAVING YOUR DISK Whatever you do with the copies of your cross-linked files, you also have to decide what to do with the disk that holds the original versions of these files. You've got two choices.

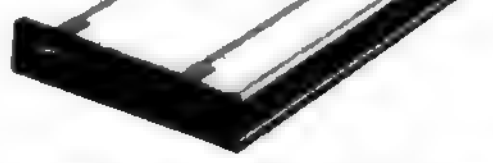
The hard-core choice is to consider the disk damaged, and either throw it away or reformat it. (Whether you toss it or reformat it, you'll first want to copy any other files that you don't have copies of.) If you choose this hard-core option for a floppy disk, you might as well toss the disk because it's cheap enough to be considered disposable. Hard disks are getting cheaper, but they're not so inexpensive as to be considered throwaway items. Thus, you'll want to reformat your hard disk to give it a new lease on life—unless you have reason to believe that your disk is so messed up that you want to replace it.

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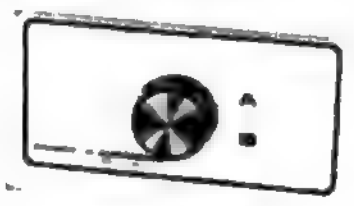
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■ **PETER NORTON**

this one instance of two cross-linked files, it's reasonable to assume that the disk itself isn't flawed, but that some software or power glitch damaged one file's allocation chain. In that case, the reasonable thing to do is to take the "soft-core" approach and use the DEL command to erase both files. This will clean up the cross-linking mess and should leave the rest of the disk intact.

I think that the soft-core choice is the sensible one, even for a floppy disk. With a hard disk, unloading all the good files, reformatting the disk, and then loading the files back is such a pain in the neck that I would much prefer to just erase the two suspect files and let it go at that.

MULTIPLE CROSS LINKS All my advice so far has been based on the assumption that you have only two cross-linked files. If you've got loads of them, it's a different story altogether; it's likely that the *entire* space allocation, the whole FAT, has been turned into hamburger.

In this case, the only reasonable thing to do is to reformat or discard the disk. Moreover, the chances are so great that *every* file on the disk is a garbaged mess that it's probably not worth your time and effort to even attempt any rescue operation.

■ If the file allocation is scrambled, then COPY will just make a mess of things.

Of course, your decision will depend on how desperate you are to get your data back. The chances of your data's being any good are slight, with one exception. If your data is the unstructured, easy-going variety that I discussed before, it can be worth sweeping through the disk to transfer off whatever you can. However, in this case, you shouldn't count on the COPY command to gain access to your lost data. If the file allocation is scrambled, then COPY will probably just make a mess of things (missing some data and duplicating other data, thanks to all that cross-linking of files). Instead you should use a program that can sweep through an entire disk and transfer off any usable text data that it finds. Text Search, one of *The Norton Utilities* programs, can do that and so can, in a different way, a competitor of mine, *PC Tools* from Central Point Software.

In my next column, I'll look at some more of the things that can go wrong with disks and what you can do about them.

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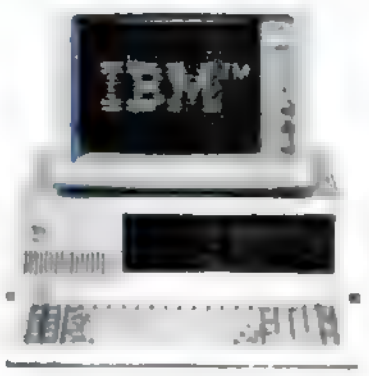
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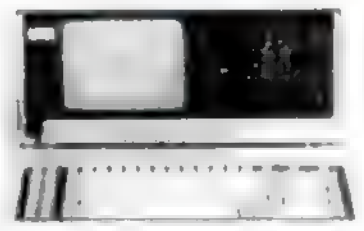
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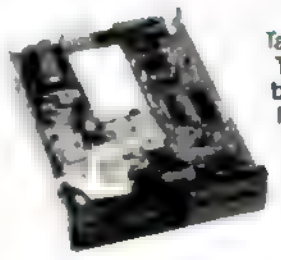
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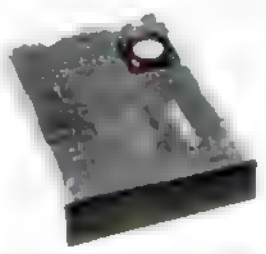


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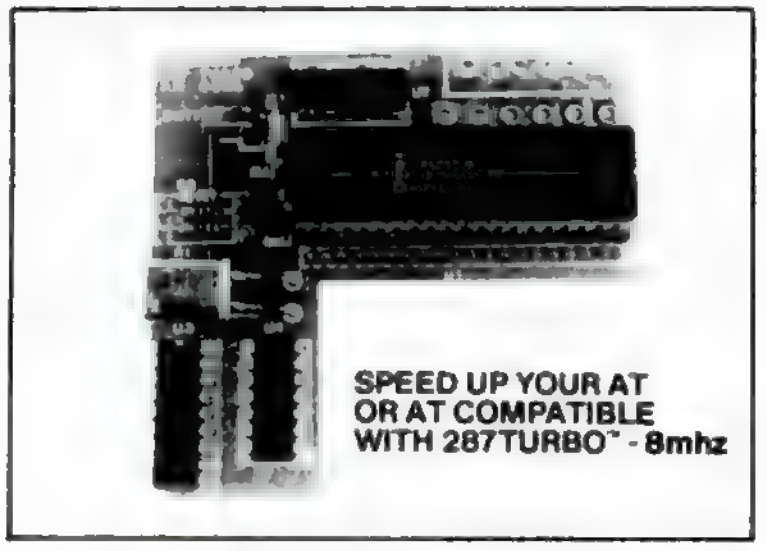
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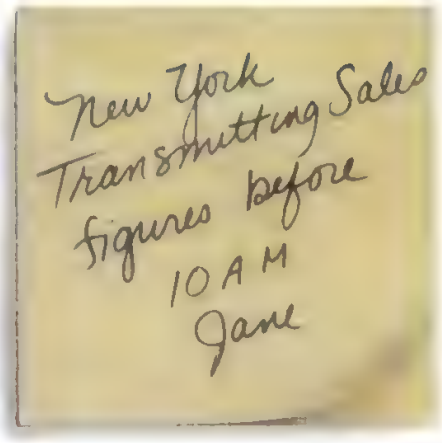
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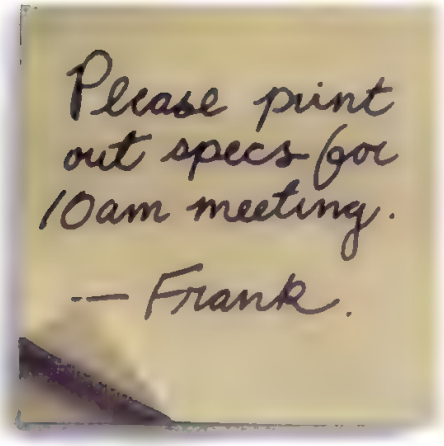
DCache plus 64K ABOVE BOARD PS	375
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CIRCLE 165 ON READER SERVICE CARD

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AST's RAMpage! solution has it all. Expanded memory and the powerful software to use it.

The More Advanced Memory Board. Fully compatible with all software developed for use with the Lotus®/Intel/Microsoft® Expanded Memory Specification (EMS), RAMpage! employs a more advanced version of this memory expansion technique—Enhanced EMS. The result is greater processing speed and more flexibility with Enhanced EMS software. And, of course, RAMpage! gives you the extra memory needed for regular EMS software packages and updates, like Symphony™ 1.1 and Lotus 1-2-3® version 2.0.

A single RAMpage! board offers up to 2 Mb of expanded PC RAM in addition to your current PC RAM of up to 640K. And, regardless of how much RAM your PC now has, AST's Split Memory Addressing™ fills in conventional memory up to 640K and utilizes the remaining RAMpage! memory for expanded memory software or RAM disks.



Access nine applications with DESQview's windowing capability for true multitasking performance.

For ultimate PC memory, up to four RAMpage! boards can be installed in a single system for a maximum of 8 Mb above 640K.

Powerful Multitasking/Windowing Software. Beyond 640K, productivity takes a giant leap forward with DESQview,™ an Enhanced EMS multitasking and windowing software program. It's a standard feature of the RAMpage! solution and a value you won't find with any other EMS board.

Specifically tailored to take advantage of the RAMpage! Enhanced EMS design, DESQview offers the fastest, most dynamic multitasking/windowing environment available on your standard PC.

DESQview organizes up to nine programs using conventional and expanded memories and lets you access each application via window displays. You can run programs in a background mode while you work on others in the foreground. And, full

introduces the 640K barrier.

compatibility with the Topview® Application Program Interface file structure ensures a vast selection of compatible applications.

With DESQview and RAMpage! you can search your dBASE II™ file, total your 1-2-3 spreadsheet, compose a business letter using WordStar,® and move or copy information from one application to another, and more—all while your mailing labels stream off the printer.

RAM Disks and Print Spooling. Everything beyond the 640K barrier isn't new. You'll find some familiar AST standards, too.



RAMpage! the Enhanced EMS board for up to 2 Mb of PC RAM.

Like our SuperPak™ utility software, specifically designed to take advantage of your new expanded memory. SuperPak includes SuperSpool™ that allows you to use your PC while printing and SuperDrive™ for creating 360K RAM disks. And, our new addition to SuperPak, fASTdisk,™ allows you to create large RAM disks that emulate hard-disk drives. The size of a fASTdisk is limited only by your total system memory.

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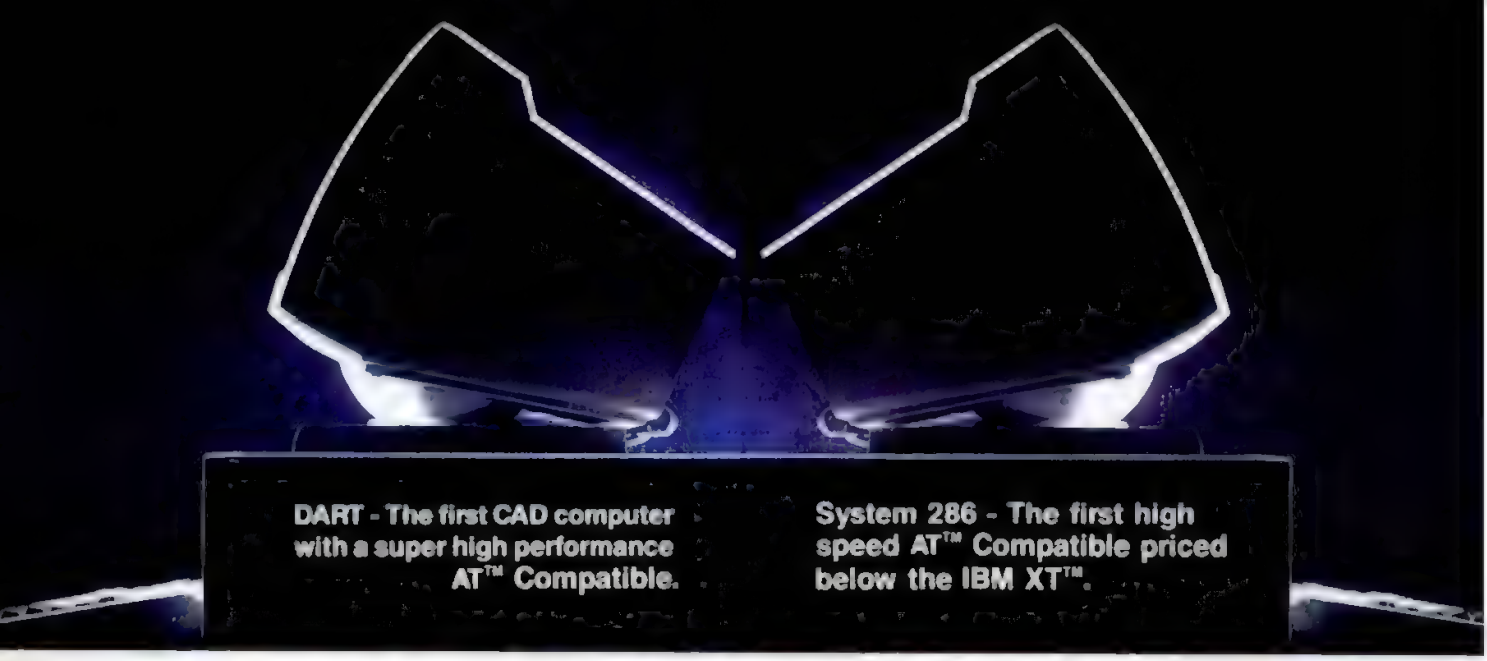
Specifications:

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- *Up to 2.0 Mb expanded memory per board— 8.0 Mb total per system.*
- *Includes DESQview multitasking/windowing software.*
- *Includes SuperPak utility software with new fASTdisk.*
- *Enhanced EMS design for superior performance with enhanced EMS software.*
- *Fully compatible with all EMS software.*
- *Standard 2-year warranty.*

AST RESEARCH INC.



CIRCLE 104 ON READER SERVICE CARD

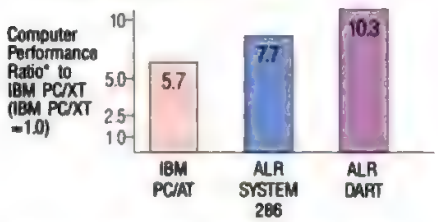


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At ALR we don't think your performance should be limited by the 'Standard'. So preoccupied are today's computer makers with meeting the 'Standard', they seem to have overlooked the opportunity to do something much more worthwhile.

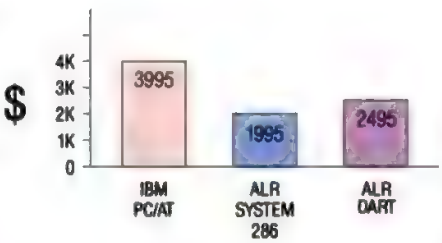
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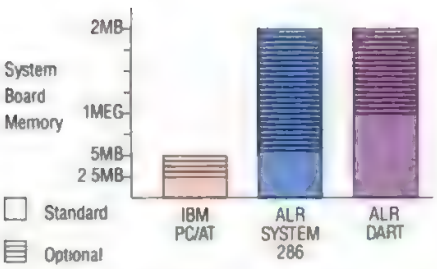


*Based on the Norton Utility SI-System Information Command.

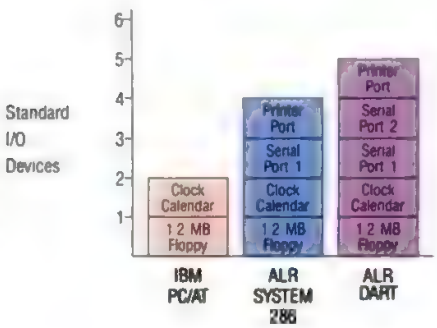
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CIRCLE 521 ON READER SERVICE CARD

■ JIM SEYMOUR

LOTUS'S 1-2-3, RELEASE 2: WHAT DIDN'T GET FIXED



When Release 2 came out, 1-2-3 aficionados started buying up the remaining copies of 1A. This informal comparison accounts for the run on the older version.

Some programs have such a hold on us—they become such integral parts of our working style—that we begin to feel very possessive about them. If there's an eminent domain principle under which governmental entities can take over land, there's a comparable preeminent domain under which users seize such wonderful tools as *1-2-3*.

Which goes a long way, I think, toward explaining why so many of us are so possessive about Lotus's first offspring. And why we think we know even better than Lotus what's wrong with it and ought to be fixed.

And thus, why so many of us who know *1-2-3* intimately are so irritated at *1-2-3*, Release 2.

IMPROVED BUT UNNEEDED PC users are not exactly flocking to the *1-2-3* R2 upgrade. Partly because the tab's too high at $150 ($125 in sufficient quantities); partly because not many need what R2 adds to the existing Release 1A; and partly—largely, I suspect—because a lot of them resent being asked to pay a bundle to upgrade to what really ought to have been called Release 1.2.

One measure of users' unhappiness is what a hot item remaining stocks of the previous Release 1A became late in November and December when *1-2-3* fans compared the two and heard that 1A wouldn't be around much longer. A discontinued version that had been selling for a little over $300 was suddenly drawing the full $495 list price. And some buyers offered to pay a premium for the old version.

THE WRONG STUFF To be fair: *1-2-3* R2 is full of nice stuff. Even though some users have stubbed their toes on a few R1A/R2 incompatibilities, most everything in R2 is worthwhile. The trouble is, there's not enough new and better in R2; most irritatingly, some of the most fundamental omissions in R1A weren't fixed.

A VERY FEW EXAMPLES Adding support for the Lotus-Intel-Microsoft Expanded Memory Spec (EMS) is nice. (After all, bigger *1-2-3* spreadsheets were the primary reason Lotus hatched the EMS.) But the number of people who want or need to build really huge spreadsheets is very limited. Instead, most of them would happily use a decent consolidation feature—something a lot of us expected in R2 but didn't find. The ability to consolidate results from several worksheets into one succinct recap sheet remains the one area in which *MultiPlan* has it all over *1-2-3*.



And breaking out the documentation for R2 into more manageable paperbacks was a nice touch. But where's the "For Experienced *1-2-3* Users, Here's What's New" booklet?

YES! WE HAVE NO ON-DISK TUTORIAL! And although the printed documentation is very nice and the state-of-the-art help screens are still wonderful, where's the disk tutorial? It's almost inconceivable that the company that defined how disk tutorials ought to look and work with Release 1 abandoned its handiwork. But there's no tutorial disk in the *1-2-3* R2 package.

And finally getting around to supporting 8087/80287 math coprocessing chips is nice. But doesn't make much real-world difference unless you're using a lot of exponentiation or trig functions, which are rarely found in businesspeople's spreads—far and away the biggest users of *1-2-3*.

STUMBLING ON THE SAME PROBLEMS And some of the new @-functions are nice. But there's still no @-function for single-payment annuity (PV) calculations—a far more important function than the ordinary annuity @-function in the program since R1.

And the improvements in *1-2-3* graphs are nice; I like exploded pie-chart slices, too. But there's still no intelligent way to specify and store with the .WKS file border-range assignments for second and succeeding pages of multipage printouts without getting them on page 1, too—a fun-

Illustration: Warren Gebert

■ JIM SEYMOUR

damental output formatting problem a lot more important than exploding pies. (Using named ranges, such as PAGE1 for the first-page range, BORDERS for top-of-the-page column headers, and RESTOFIT for the balance of the spreadsheet is a workable, if clumsy, way around the problem.) Doesn't anyone at Lotus ever print out multipage spreadsheets?

And being able to (legally) boot from a hard disk without sticking a key disk in drive A: is nice. But the new flavor of copy protection that Lotus inflicted on the program is especially nasty: because of its approach to copy protection, restoring a backup tape of your hard disk trashes the program unless you remember to exclude read-only files from the backup-and-restore process. Wonderful: just about the time we get used to making frequent backups, the Big Gorilla of the software business starts discouraging backups with that kind of craziness. (Things are OK if you make mirror-image backups; they get messed up only if you use the file-by-file approach without excluding read-only files from the process. And in all fairness,

■ PC users are not exactly flocking to the 1-2-3 R2 upgrade, partly because the tab's too high at $150.

Lotus's Customer Support is reasonably good about supplying additional disks to legal users who've fallen into the company's traps.)

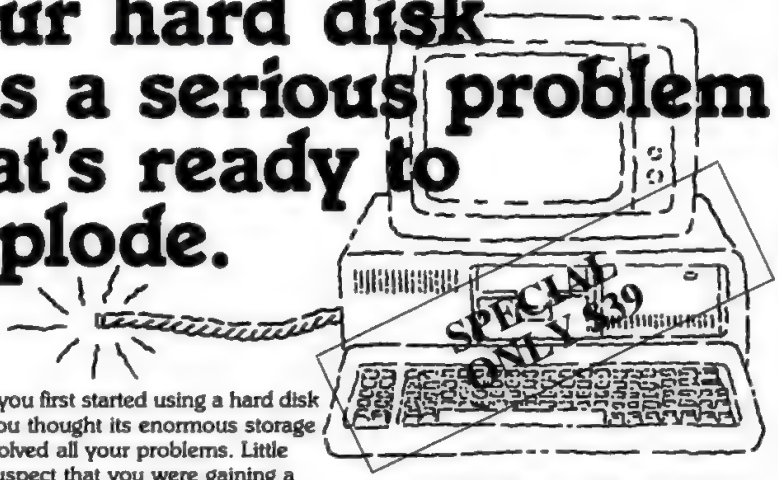
Most everyone I know who uses *1-2-3* more than very occasionally had his or her own little list of what was wrong with R1A that would surely be fixed when they got around to Release 2. What's striking is how few feel the company got around to many items on their lists.

LEND A HELPING HAND Maybe we can help the folks up in Cambridge a little. Lotus clearly understands that *1-2-3*'s going to have a long life and remain their cash cow for some time to come; we can fairly assume Release 3's coming someday.

Send me a note with what you'd like to see fixed, or added, next time around. I'll see that it gets into the right hands at Lotus.

If we use and love *1-2-3* so much we think we own it, let's start acting like owners and tell our managers what the hell they're doing wrong.

Your hard disk has a serious problem that's ready to explode.



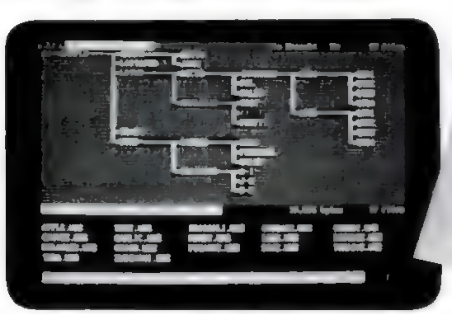
When you first started using a hard disk system, you thought its enormous storage capacity solved all your problems. Little did you suspect that you were gaining a new problem that's getting out of control: Disk organization.

Now that your hard disk can literally hold thousands of files, how are you going to easily find the one file you want, whose name you may have forgotten? Sort the files in some kind of logical order? Rename them or move them around?

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You can sort five ways, including alphabetically. Its search function is so fast, it can locate the file you want in less than two seconds! Even if you don't remember the file's exact name, KEEPTRACK will find it! Full on-screen help is always a keystroke away. And all this is just a small sample of how KEEPTRACK can solve your PC problems.

KEEPTRACK even comes with a book that clearly explains the "why's and how's" of disk management. It alone is well worth the price of the entire package.

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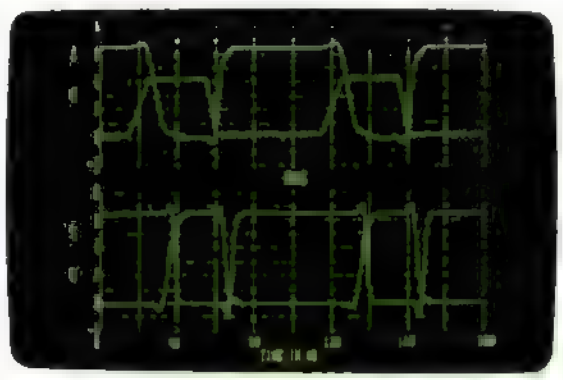
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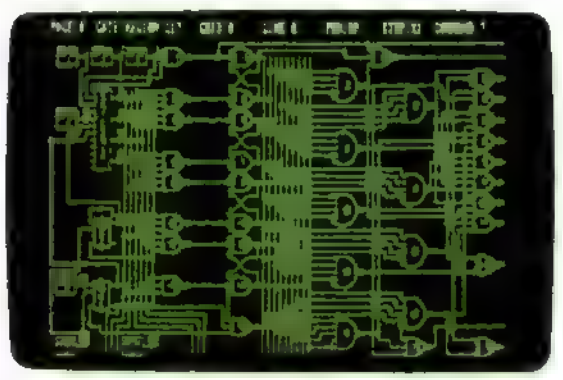
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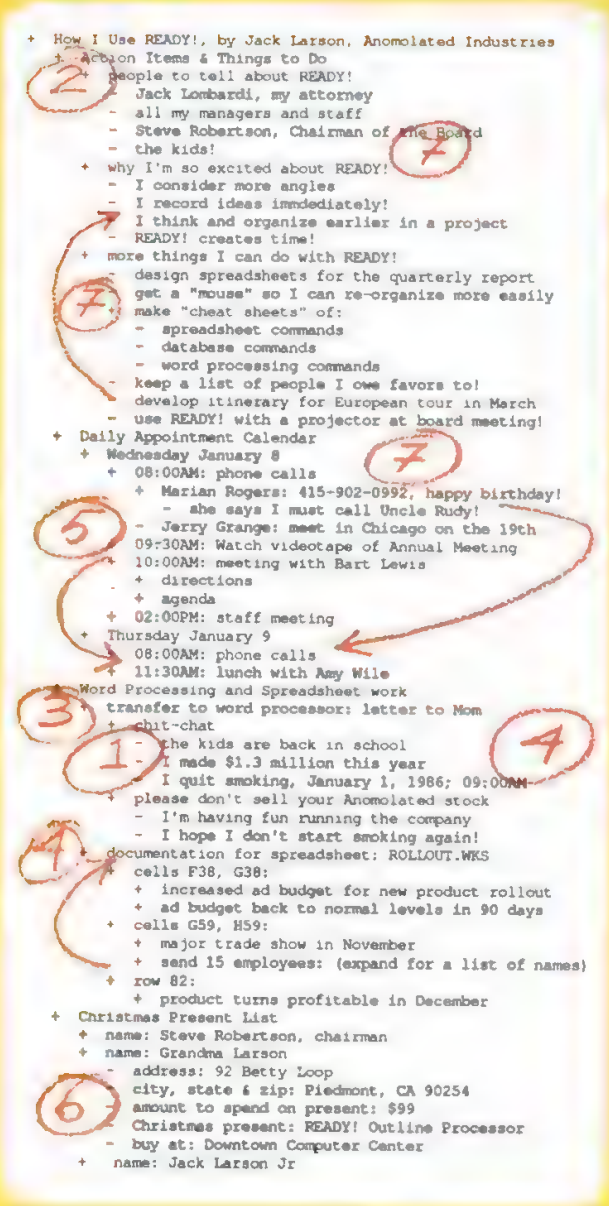
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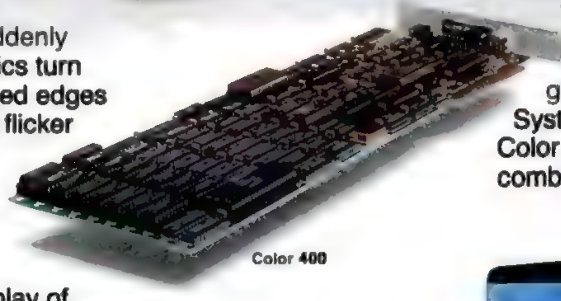
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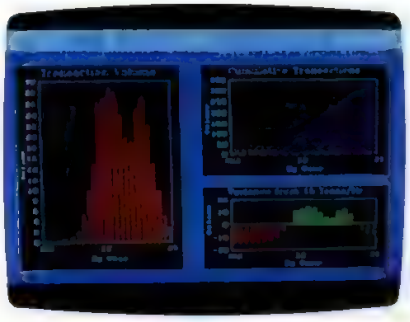


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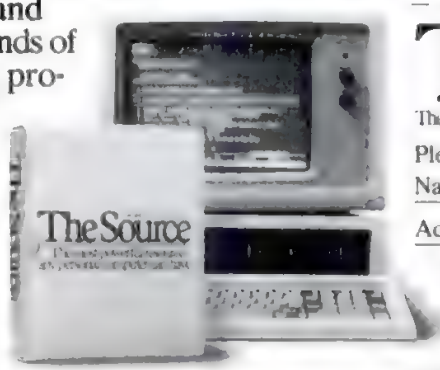
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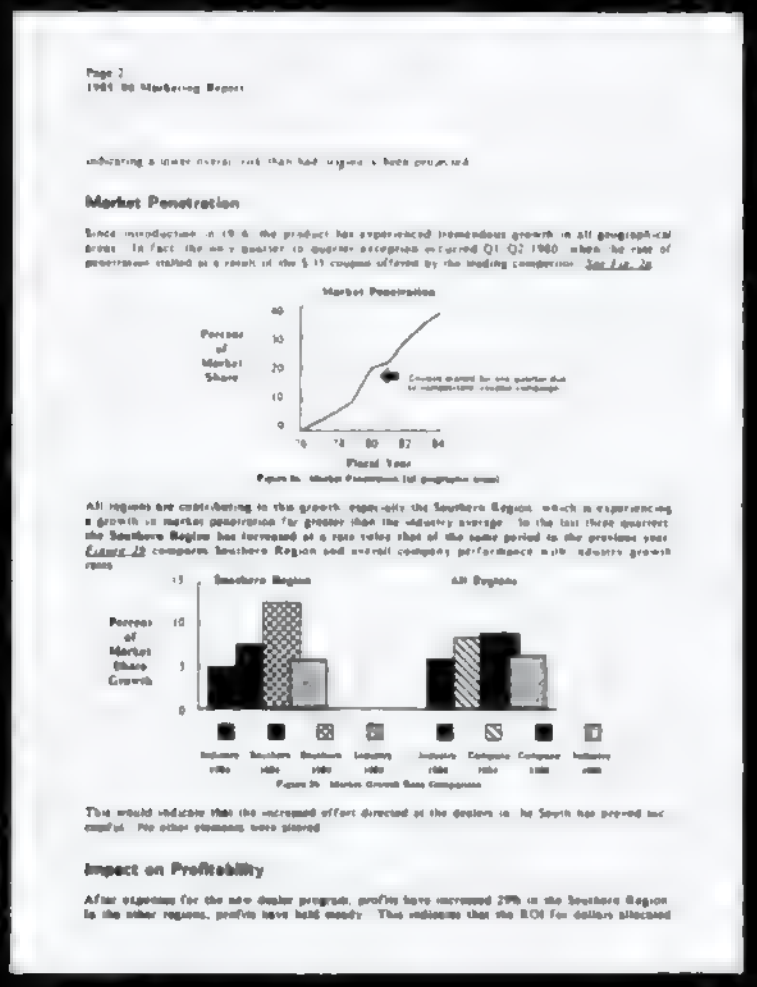
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CIRCLE 378 ON READER SERVICE CARD

■ STEPHEN MANES



IBM VS. IBM

Is the world's largest computer company its own worst enemy? Manes thinks IBM is doing itself damage by letting product quality and service slide.

What's IBM's greatest antagonist, the most fearsome opponent inhibiting its success? If you ask me, it's IBM.

Now, I'm not someone who enjoys tossing brickbats at Big Bad Blue. I've been an IBM fan since the day I became a customer, and I've been a customer for years. IBM has always seemed the model of a company that works.

When my old Selectric faltered, one phone call would bring a polite, well-dressed, competent technician to solve the problem with dispatch. In the early days of my PC, IBM replaced a dead monitor within a couple of hours. And even though it wasn't official company policy to swap defective cards without examining the machine, a sympathetic technician arranged a trade for a mildly unstable monochrome card. IBM charged plenty for all this, but it stood for dependability and service.

It still claims to, I guess, but its shining reputation is beginning to tarnish. Let's face it: IBM's record since the introduction of the PC has been something less than superlative.

THE LEAST YOU CAN DO What's appeared in IBM's linen software boxes, for example, has been uniformly dismal. A small niche in the corporate world may have a need for PC clones of the Displaywriter's software, repackaged editions of *PFS:WRITE*, BASIC-language financial software, or *TopView*, with support coming only from baffled dealers. The rest of us shop elsewhere.

Peripherals? Well, in most PCs, the only expansion cards with an IBM logo are the ones that come with the machine. IBM took forever and a day to get a full line of underwhelming printers to market. Its network offerings have stimulated more confusion than productivity. And the Enhanced Graphics Adapter, with its one functional connector and multiple switches whose improper setting can fry a monitor, virtually defines the phrase "It's the least you can do."

IBM's follow-on PCs haven't exactly stimulated encomiums to the genius of Thomas Watson's successors either. The one unqualified winner was the conservative XT—nothing more than a PC box stuffed with extra slots and a hard disk. But the PC Portable came off as an inferior clone of the Compaq, and the less said about the PC*jr* the better. As for the AT, well, that machine best typifies the love-hate relationship between customers and Big Blue.



Illustration: Warren Gebert

BRAKELESS PORSCHE At first glance, the AT seems highly desirable. Look a little closer and you have to wonder. Weird stacked 128K-bit memory chips populated the original motherboard where 256K-bit chips should have been. The 1.2-megabyte disk drive can read standard-format disks but can't write them. That drive is supposed to be the main backup device, but nobody uses it because it can't back up the whole hard disk at one go. The only other IBM-label backup device is a second hard disk.

The absence of backup protection is particularly grim considering the original disks' unreliability. Among AT users I know, the person whose hard disk hasn't failed is the rare exception. Offering this unit without backup is like selling a Porsche without brakes.

The original AT drives' failings have been documented again and again, yet IBM's response has been from the Richard Nixon Stonewall School: Minimize the problem and hope it will blow over. IBM says it "stands behind the drives," but not to the extent of paying consequential damages or even extending the warranty period. True, IBM now makes its own drives, but the baddies are still out there. Until IBM faces the problem, you could conceivably get one as a replacement if your new-model drive goes on the fritz.

In the past, IBM has done right by its customers. It offered a free replacement for the original PC*jr* keyboard (and that keyboard worked) and for *EasyWriter* (which didn't). By contrast, today's IBM seems imperious and unresponsive.

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■ STEPHEN MANES

SLOWING THE SPEEDUP In answer to the brisk trade in speedup crystals for the AT, IBM now equips 30-megabyte models with ROMs that won't permit the upgrade. The company will say only that the AT has been tested only at 6 MHz and "could yield unreliable results" at higher speeds.

Okay, then, IBM, go ahead and test it at those speeds! Publish the results. If the crystals cause problems, tell us precisely *how*. Will they blow up the motherboards, cause an occasional software glitch, or what? Hard evidence might counter the common assumption that you're just a bunch of greedy spoilsports out to charge an unnecessary premium for extra speed sometime in the future.

NOT EVEN A POSTCARD IBM service seems to be on the decline as well. When a disk drive died, my desperate pleas to the service center to at least attempt to get my machine back to me overnight were met with a very careful recitation of the 48-hour turnaround policy and a rather rude reminder that even that was not fully guaranteed under the terms of the service policy.

User support has been rotten since Day One. Funneling all problems through harried, ill-equipped dealers virtually guarantees dissatisfaction. Ever try to explain BASIC compiler glitches through an intermediary who barely knows what a BASIC compiler does? Major bugs in DOS and other software go uncorrected for months; dealers eventually get the fixes, but users never get so much as a postcard to let them know. A little-known customer service line for unresolved problems—(305) 998-6048—is likely to advise you to try your dealer again.

Service to software developers is equally scanty. Many were stymied for months awaiting the *Technical Reference Manual* for the Enhanced Graphics Adapter. One local developer spent months trying to get IBM to reveal the simple but undocumented escape codes for two of the Wheelprinters' special characters.

TOP DOLLAR For all this, IBM charges top dollar. Equipment that underperforms the competition sells at a premium. Generic items—disk drives, disks, and the like—cost more than double when ordered with an IBM label. Even novices are beginning to catch on.

Maybe holding IBM to its own once-lofty standards is unfair. Certainly other outfits have their problems. But at its height, IBM's mystique was such that customers felt they couldn't go far wrong by taking the classic two-word, six-letter advice: "Buy IBM." Not anymore.

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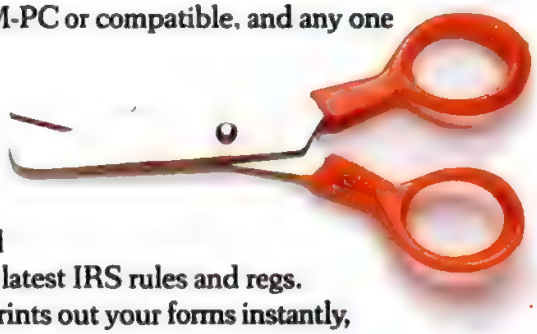
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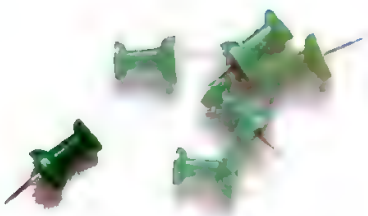
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In fact, we've found that a good diskette manufacturer simply manufactures a good diskette...no matter what they charge for it. (By way of example, consider that none of the brands that we carry has a return rate of greater than 1/1,000th of 1 percent!)

In other words, when people buy a more expensive diskette, they aren't necessarily buying higher quality.

The extra money might be going toward flashier advertising, snazzier packaging or simply higher profits.

But the extra money in a higher price isn't buying better quality.

All of the good manufacturers put out a good diskette. Period.

How to cut diskette prices ...without cutting quality.

Now this discovery posed a dilemma: how to cut the price of diskettes without lowering the quality.

There are about 85 companies claiming to be "diskette" manufacturers.

Trouble is, most of them aren't manufacturers.

Rather they are fabricators or marketers, taking other company's components, possibly doing one or more steps of the processing themselves and pasting their labels on the finished product.

The new IBM diskettes, for example, are one of these. So are IBM 5¼" diskettes. Same for DYSAN, Polaroid and many, many other familiar diskette brand names. Each of these diskettes is manufactured in whole or in part by another company!

So, we decided to act just like the big guys. That's how we would cut diskette prices...without lowering the quality.

We would go out and find smaller companies to manufacture a diskette to our specifications...specifications which are higher than most...and simply create our own "name brand" diskette.

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We found that there are several manufacturers who don't give a hoot about the consumer market for their diskettes. They don't spend millions of dollars in advertising trying to get you, the computer user, to use their diskettes.

Instead, they concentrate their efforts on turning out the highest quality diskettes they can...because they sell them to the software publishers, computer manufacturers and other folks who (in turn) put their name on them...and sell them for much higher prices to you!

After all, when a software publisher or computer manufacturer or diskette marketer puts their name on a diskette, they want it to work time after time, everytime. (Especially software publishers who have the nasty habit of copy-protecting their originals!)

Super Star Diskettes. You already know how good they are. Now you can buy them...cheap.

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Super Star Diskettes are good. So good that a lot of major software publishers, computer manufacturers and other diskette marketers buy them in the tens or hundreds of thousands.

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And than we sell them to you.

Cheap.

When every little bit counts, it's Super Star Diskettes.

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Please be careful!

A lot of the "no-name" diskettes flooding the market at prices of less than $1.00 are what we in the industry call "floor sweepings."

In other words, they're garbage...stuff that six months ago, no self-respecting manufacturer would have sold.

But times got tough and some people's scruples got a little lost in desperation...and so a lot of computer users are getting some really bad disks...and that isn't bargain at all.

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■ STEWART ALSOP

WHY COMPAQ SHOULD MAKE THE APPLEATER



A Macintosh-like DOS computer would almost guarantee Compaq a brighter future—one in which it would be a real player in the personal computer market, not just a mere clone maker.

So why would Compaq Computer, the company that made its reputation and $500 million in revenues last year on a very conservative definition of compatibility, even want to build ApplEater, the Macintosh-like DOS-compatible computer I described in my last column? In that column, I posed a challenge to Compaq president Rod Canion to live up to his statements that it is possible to build an easy-to-use computer much like Apple's Macintosh without sacrificing compatibility with DOS, the industry's standard operating system.

As you know by now, Compaq just introduced a new computer, a stripped-down version of its well-regarded 286 portable computer. This computer is prototypical of how Compaq designs computers: it is yet another better-designed, better-engineered version of an IBM PC. But it has nothing to do with what I proposed to Compaq.

If, indeed, personal computers have the potential to revolutionize the way we all work, then most people would agree that these machines must be easier to use (if you don't, stop here and go read Peter Norton's column).

HALF A MILLION APPLES As I pointed out in my last column, Apple has managed to establish the value of an easy-to-use-and-learn graphical interface by selling half a million units of a slow, expensive, incompatible computer. Along with establishing the validity of a market for easy-to-use computers, Apple has also demonstrated that the only way to achieve that ease of use is to build it into the computer so that your decision to buy the computer is based on these built-in features and so that all of the software written for the computer takes advantage of them. Every piece of Macintosh software makes assumptions that can't yet be made in the design of IBM PC software: the existence of the mouse, the existence of a high-resolution, bit-mapped screen, and the existence of a set of routines in ROM that create text and graphics and route system calls to the right place (usually).

IBM, on the other hand, has been allowing people to build their own easy-to-use computers. But the very nature of people who are likely to want ease of use as a feature makes it unlikely that they would take the time to learn how to build one out of off-the-shelf components. And software developers can't depend on enough people building their own easy-to-use computers to make their software take advantage of the special features of such computers.



OUT ON A LIMB? So why should Compaq, a company that has made its reputation by being conservative, take such a bold and risky step as building ApplEater?

First, if it is Compaq's role to respond to its customers' needs, then such a computer would most definitely respond to a well-voiced need.

Second, if Compaq is going to continue growing as a company, both in the volume of its revenues and the breadth of its products and capabilities, it must find new markets to address. The company is selling about 20,000 units of its existing models every month. If ApplEater could sell as many units as the Macintosh without affecting Compaq's existing sales, it would double the company's business.

Third, if Compaq wants to establish an image for itself beyond its present position as a "mere" clone maker, it must eventually build a computer that provides more than compatibility (more even than the Telecompaq, which has communications features, and the Compaq Tempest, which provides ruggedness features required by the military). ApplEater not only would be a brilliant engineering feat but would mark Compaq as a company that shouldn't be trifled with in the personal computer market, as a true market leader instead of a mere follower.

A BOLD STROKE What we have here is a proven market opportunity, a proven strategy for penetrating that market, and a set of proven technologies (as outlined in the last issue) that, taken together, can be turned into an easy-to-use, DOS-compati-

Illustration: Warren Gebert

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■ **STEWART ALSOP**

ble computer that doesn't force buyers to choose between DOS and Macintosh.

So what are the risks inherent in Compaq's choosing to make this bold move?

Perhaps nobody would develop software for the machine, believing that it would be better to wait and see if the machine is successful. But Microsoft says that it is very easy to bring existing Macintosh applications into the *Microsoft Windows* environment, which would give Compaq a relatively easy way to attract a surprisingly large and high-quality software base (of about 1,000 Macintosh software products) to its new machine.

Perhaps dealers wouldn't be willing to stock the machine and its software, since that would require extra shelf space and inventory. But Compaq has such a reputation with dealers at this point that it wouldn't take much effort to persuade dealers to give the machine a chance.

Perhaps nobody would buy the machine. That's the essential risk behind ApplEater. But companies need to take chances, and this one looks like one of the best bets I've seen in this business.

For Compaq to introduce ApplEater would be a bold stroke indeed. But boldness is a disease in the personal computer industry, one that more often than not has killed or seriously disabled the companies that have considered themselves the boldest.

STAYING AHEAD The problem is that boldness plays a significant role in the personal computer business by pushing the state of the art and challenging established companies to get out of their ruts. Anytime you have a business that grows as fast as this one has grown and that depends on a technology developing as quickly as personal computer technology is developing, it's almost a prerequisite to be bold, simply to stay ahead of the competition. (That's the theory, at least.)

Only two computer companies seem to have been successful without being bold: IBM and Compaq. IBM displayed a certain amount of boldness when it first introduced the IBM PC by ignoring some of its own past practices, but it no longer needs to be bold now that it dominates the market. Compaq made a virtue out of not being bold, by sticking as closely to the standard as possible and by following a clear strategy and offering as much value as possible.

So it may not be possible for Compaq to perceive the opportunity inherent in the conflict between ease of use and functionality in the DOS world. But I'm willing to bet that somebody will. Personally, I hope that somebody is Compaq: it would be sure to do it right.





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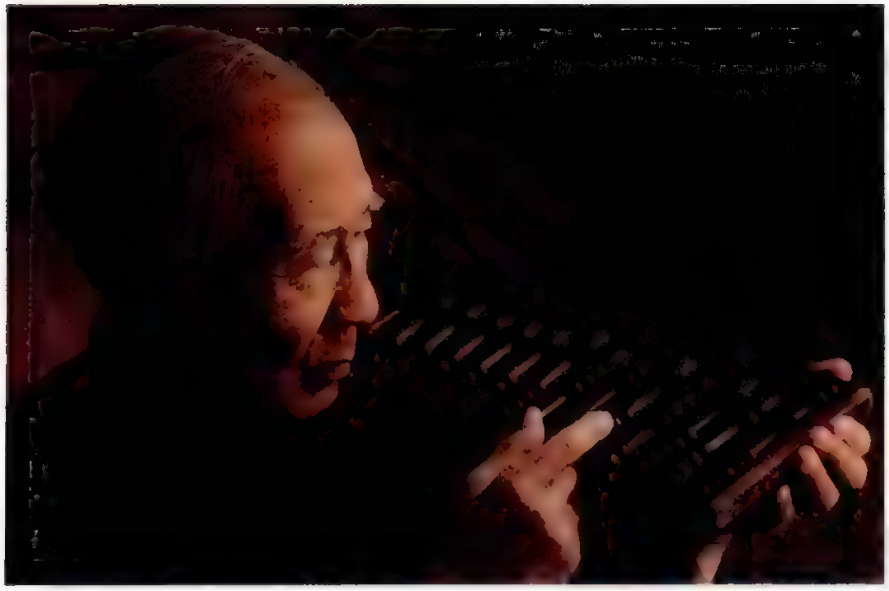
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The menu mode operates true to its name, with menus showing all the commands you have to choose from. And there isn't a thing you can't do from the menu mode because it's comprehensive.

You'll want to use the batch mode for routine operations though, because it allows you to create a "file" to contain those operations and run them automatically, just by hitting a few keys.

But probably the best example of just how downright civil the Galaxy systems can be is our auto backup. You just preset the time and the desired function, and the system does the rest. Automatically.

No other tape backup systems, by the way, operate this simply.

The features all tape backups should have. But don't.

Before you make your first backup—which is the right time to do this—our installation software checks your disk configuration to make sure your tape drive will run at top speed. And it checks the entire system to guarantee it will perform as promised. No competitive system offers anything like it.

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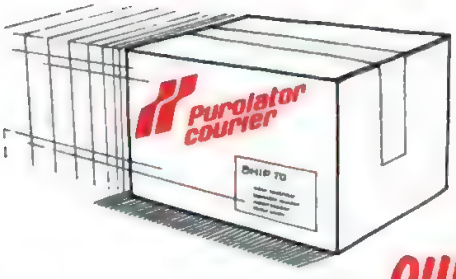
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CIRCLE 239 ON READER SERVICE CARD

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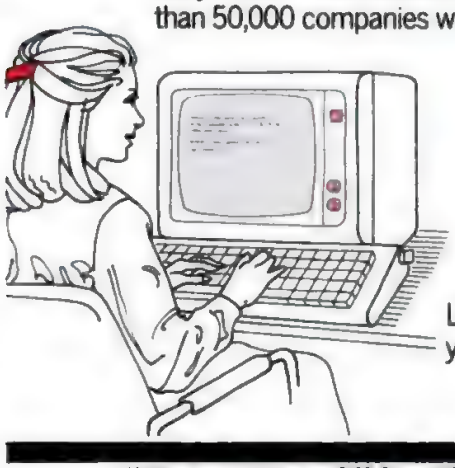
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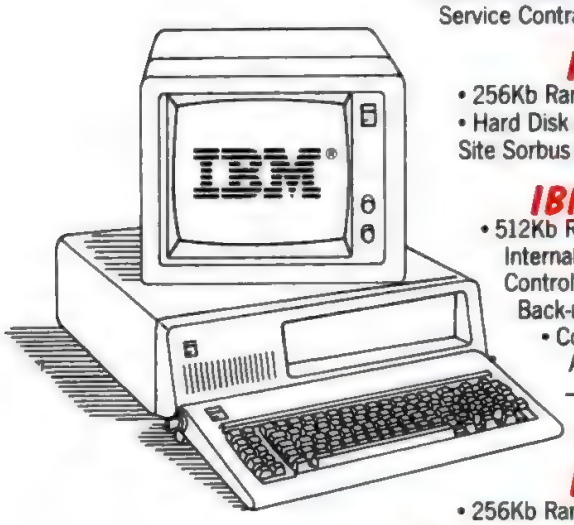
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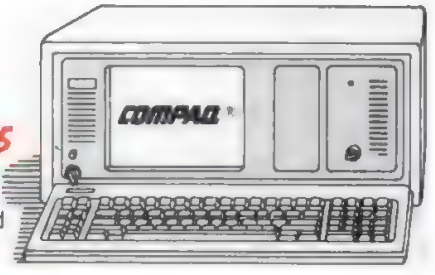


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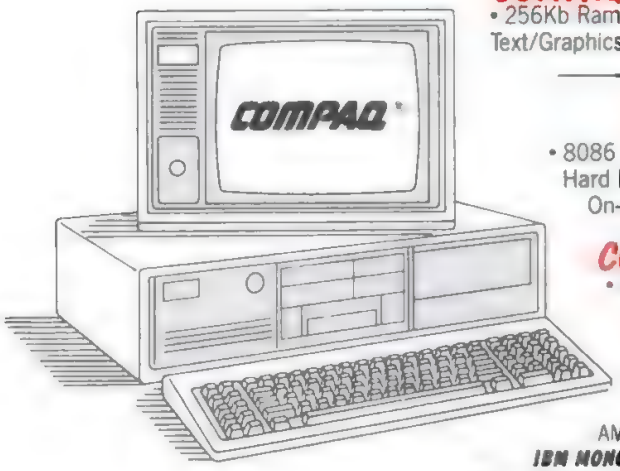
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PCM





While they can't pick the winners, investment programs help you make better decisions. In this issue, analysts from three major brokerage firms report their findings on software tools for individual and professional investors.

R·A·T·I·N·G Investment Software

Stocks and bonds posted one of the best years on record in 1985. The Dow Jones industrial average surged more than 300 points to gain over 25 percent for the year, closing at 1546. Interest rates on bonds dropped to their lowest level in 6 years, causing stock prices to soar.

What will happen next? Nobody can say for sure, but increasing numbers of people have gained the financial savvy to make their own predictions. And they're putting their money where their mouths are. According to a survey by the New York Stock Exchange, the number of individual investors participating in the stock market in 1985, in one form or another, rose to 47 million. That's more than one out of every five persons living in the United States.

Not only do more

TECHNICAL ANALYSIS

FUNDAMENTAL ANALYSIS

PORTFOLIO MANAGEMENT

Photograph: Robert Phillips



Cheryl J. Goldberg and Thomas A. Meyers at the American Stock Exchange.

Thomas A. Meyers *is an investment technologies consultant in Lawrenceville, New Jersey. He is the author of the* Dow Jones-Irwin Guide to On-Line Investing: Sources, Services, and Strategies *(for more information turn to this issue's Book Review). Meyers is an expert on using personal computers for investment purposes.*
Cheryl J. Goldberg *acted as project manager and editor for this investment software issue of* PC Magazine.

people than ever know how to analyze the ups and downs of the stock market, but the tools they choose to aid their analyses are becoming more sophisticated. Much of investment analysis involves sifting through vast amounts of figures and then crunching them up in various ways. What better application for a PC and software? In fact, a large number of software packages have recently come onto the market that are designed to analyze and track investments of every type.

This special issue of *PC Magazine* is devoted to evaluating all varieties of investment tools. Never before has such a comprehensive guide to investment products been attempted. This issue fills a significant information gap in the field of investment software. Up until now, potential investment software purchasers have had great difficulty finding these packages and making appropriate choices. The reason is that virtually all investment software is sold through the mail. Once you've located a few packages, you typically have to take the vendor's word on what it does and how good it is. It's difficult to compare and contrast similar products. And, since this is a specialized area, newer than many traditional PC software markets, market forces have yet to complete their inevitable task of eliminating inferior products.

All the more reason, then, for the editors of *PC Magazine* to put together a guide providing evaluations of the quality of each package in terms of its investment tools and of the software design itself.

Since this software is not designed to invent new investment techniques but rather to speed them up, we found that it comes in three main groups: technical analysis, fundamental analysis, and portfolio management software. These categories yielded 48 packages for our reviewers to evaluate. We also discovered the smaller, more specialized categories of options and fixed-in-come securities software and examined representative samples of each.

EXPERT REVIEWERS To do the evaluations right, *PC Magazine* asked experts in each of the three major areas to test the products and report their results. Technical analysts from the Technical Research Department at Smith Barney, Harris Upham & Co. Inc. have reviewed the technical analysis packages. Experts from Dean Witter Reynolds who are responsible for choosing packages for brokers have taken on the fundamental analysis packages, and Shearson Lehman Brothers analysts evaluated the portfolio management packages.

The reviewers scrutinized the overall quality of the packages, looking for ease of installation and use and helpfulness of the documentation. Perhaps, more important, they looked at the quality and validity of the investment tools and techniques. In addition, they examined the packages from two perspectives: professionals, such as stockbrokers and money managers, who use them to choose and manage securities for their clients' portfolios, and individual investors who use their computers to take control of their own investment destinies. Much of the software is appropriate for both groups, but we've also pinpointed packages more useful to one group than the other.

■ According to the New York Stock Exchange, the number of individuals participating in the stock market in 1985 rose to 47 million.

To make this issue useful to all *PC Magazine* readers, we've included discussions of various financial instruments and

Photograph: Robert Phillips

Simulating the Stock Market

With these three stock market simulation games, you can have fun while you learn trading techniques.

Playing stock market simulation games is a quick way for experienced investors to hone their trading skills. It's also a painless way for novices to get their feet wet and gain familiarity with the terms of the investment business and a basic knowledge of what makes one stock more volatile than another. You can learn about margin calls and put options and leverage and striking prices, and how to weigh and balance the many factors that influence the price of a single stock.

But there's a big limitation to these games: reality. The factors controlling any game are finite, but those governing reality are not. So, while you can win several games and end up a pretend millionaire, if you use the same winning strategy in the real market with some real money, you could lose your shirt. Nevertheless, the programs reviewed below can teach you the vocabulary of the stock market and how some of the techniques are used in the real world.

WALL STREET: THE STOCK MARKET GAME *Wall Street: The Stock Market Game* simulates the time pressure associated with market trading, something the other games do not. Your screen is not static; it's active with information updates and price changes—even as you get your broker on the phone, the price of the stock you want can move higher or lower.

You can call up stock information on-screen, and the excellent reference manual gives you more—including definitions of terms, advantages and disadvantages of certain trades, fundamental analysis, and a Standard & Poor's report on all 30 stocks. Familiarizing yourself with the reports and learning how to read them is likely the most educational aspect of the game.

Wall Street: The Stock Market Game simulates 26 weeks of play, at three levels of expertise, which is great for new players. The majority of the game's rules are taken from the regulations of the New York and American Stock Exchanges, allowing you to place every kind of order you could place with a real broker—buy long, short, on margin, stop, fill, kill, and so on. The combination of such a variety of options with the "on-line" pace of the game creates a learning experience that is exceeded in value only by *The Wizard of Wall Street*.

Wall Street: The Stock Market Game, from O.C.O. Software, P.O. Box 1067, Tiburon, CA 94920; (800) 446-3400; costs $69.95 and requires 128K RAM.

THE WIZARD OF WALL STREET In terms of realism, ease of play, and educational value, *The Wizard of Wall Street* offers the finest combination. The speed of the game is controllable and very fast—from about 5 to 15 seconds simulating 1 trading day. If you sit still, the market moves without you; and if you move too fast, your greed begins to take over. Stock prices move across the ticker at the top of the screen, and you're always wondering, "Should I watch the ticker or go do some research?"

Interestingly, the research costs you $100 per company, and there are no guarantees. Still, that's pretty much how it works in the real market. Beta reports measure the stock's volatility in relation to the rest of the market. However, the game begins with only 12 stocks in six market categories, and though more are added as the game progresses, there just isn't enough variety of stocks.

You can do a lot with the stocks you do have, however. You can buy and sell long and short and on margin, purchase stock options, and open and close multiple positions on the same or on different stocks while viewing the ticker. You learn to move fast and to pay close attention to the way various trends and factors combine to influence the market. It's a good teacher and lots of fun, too.

The Wizard of Wall Street, from Broderbund Software, 17 Paul Dr., San Rafael, CA 94903; (415) 479-1170; costs $44.95 and requires 128K RAM.

MILLIONAIRE With only 15 different stocks in five industry groups, *Millionaire* sacrifices the variety and breadth of the real market. The available stocks are all from blue chip companies such as IBM, Exxon, General Motors, and Dow Chemical, and the game's trading session is compressed into 77 turns, each representing 1 week rather than 1 day.

You start with $10,000 but only straight stock transactions are available until you reach $12,000. At that point you can buy and sell stocks on margin. At $18,000 you can buy and sell call options as well. The imposed limitations on the market and your abilities lessen the realism (and therefore the value) of the learning experience.

However, the remainder of the game gives the player plenty of information. On each turn, you can request company descriptions, financial news, stock changes, stock and option prices, and your portfolio. Beyond this static information are tools for graphing individual stocks, industry groups, and the overall market.

Although *Millionaire* sacrifices a good deal of realism in favor of making a game that normal people will enjoy playing, it illustrates the interplay of company profits, trading volume, news, historical trends, industry trends, price changes, and other factors that influence the movement of stock prices.

Millionaire, from Blue Chip Software, 6740 Eaton Ave., Canoga Park, CA 91303; (818) 346-0730; costs $59.95.—**Phil Wiswell**

Phil Wiswell is a contributing editor of PC Magazine.

A New Breed of Investor

Lou Janson uses his personal computer as a decision-making tool and to tell his broker what to buy and sell.

Every investor's dream is to buy the stock of a young company destined to hit the big time—the next IBM, Xerox, or Tandy. A growing number of investors are turning to investment analysis and portfolio management software to help them in their quest. While none of these packages will pick the money-makers, they can speed up tedious manual calculations and other chores, leaving you more time for analysis.

Lou Janson of Seattle, Washington, is one of this new breed of investor. Janson had been investing in stocks on his own for 15 years before his brother-in-law gave him a personal computer. A photographer by trade and the holder of an M.B.A. from Harvard, Janson now uses two Dow Jones software packages—*Dow Jones Market Analyzer*, which performs technical analysis, and *Dow Jones Investment Evaluator*, a now discontinued portfolio manager—plus the Dow Jones News/Retrieval service to help him manage his portfolio of about 15 stocks.

"I'm coming in through the back door," says Janson, who claims to have low-to-intermediate computer skills. But he believes that knowledge of investing is more important. "I use the computer to supplement the tasks I would normally have done by hand. I'm not counting on the computer to do everything. It's unreasonable to expect it to.

"A lot of people start out understanding computers first and then want to learn about investing. They tend to rely on technical analysis techniques like charting. But no one using a purely technical system will become wealthy. You also have to look at fundamental factors, such as earnings, forecasts, product concepts, and market segmentation."

TIME IS MONEY Janson spends about an hour each day managing his portfolio, a third of which is spent on the computer. "I was amazed the first time I ran the *Dow Jones Investment Evaluator*. It helped me to concentrate on the portfolio. And that's how you make money. The group of stocks is what earn the money, not individual ones. With the computer monitoring each stock, I'm free to do the analysis, to think about what's going on and why."

Janson uses Dow Jones software to manage his portfolio of about 15 stocks.



Janson can get fundamental stock and company information, like earnings and earnings estimates, easily, using his PC to access the Dow Jones News/Retrieval service. But to keep on-line charges down, he chooses to get most of his data from *The Wall Street Journal* and other business journals and enter it manually. He only uses the Dow Jones on-line news service to ask specific questions.

BROKERAGE SERVICE Janson still chooses to use a full-service broker rather than buy and sell his stocks through a discount broker. He feels that his volume of buying and selling are too low to justify using a discount service, and he likes tapping the strengths of a full-service house. Because many of the companies he invests in are small, Janson can take advantage of the brokerage firm's extensive database of investment information. "I know that someone at the broker's office would have heard of the stock I'm interested in somewhere," he says.

Janson uses his PC as a personal decision-making tool and to tell his broker what to buy and sell. "Eventually, you have to make your own decisions. You can't say it's your broker's responsibility to get the winners for you."

Although he couldn't quote any round figures, Janson says that he does do well in the stock market.

Overall, Janson's system is cost-effective for his needs. Besides the cost of a *Wall Street Journal* subscription and the initial investment in the two software packages, he pays $210 per year to access the on-line data he needs to maintain his charts, "a fraction of a percent of my portfolio's value." And by keeping on-line costs down, Janson thinks he avoids getting bogged down with too much data and not enough analysis.

PAPER PORTFOLIOS Janson likes using the portfolio software for doing

"paper portfolios." "This is where the automatic monitoring features in the *Investment Evaluator* program pay off," he says. Janson can track up to 60 stocks to see how hypothetical investment decisions would work out. He also performs technical analysis as part of his investment strategy and uses the *Dow Jones Market Analyzer* to get stock charts up quickly and easily, rather than spending time hand drawing charts. In addition, he finds using *Market Analyzer* more flexible, timely, and less expensive than subscribing to a charting service. A charting service would send the charts it thinks are best, when it wants to.

"The computer lets me concentrate on esoteric things like risk versus price/earnings ratios. The charting program quickly picks up on changes in price, which is what I use more and more when making decisions. The charting program also lets me manipulate the data any way I want to."

The drawbacks Janson finds to computerized investing are that it fails to provide a feel for the product or service you're investing in. "The data doesn't tell you anything about what the product looks like, who sells it, or if its market share is expanding. The only way to do that is to go into the marketplace and see for yourself. The numbers are fine to a point, but their abstract nature tends to remove you from the reality of what's going on in the market. What you really want to know is, 'Are the people eating the hamburgers?' "

The bottom line for Janson has been that the computer is a helpful and time-saving tool. "There's no question I make better investments," he says. "As long as I know how to compensate for the machine's shortcomings, I'll use it. It's a part of my investment program, but not all of it. In the year I've had my computer, I've relied on it, and I wouldn't be without it now."—**Virginia Dudek**

investment techniques along with each section and article. Using this background, everyone will have enough information to make intelligent investment software choices.

We arranged the major review sections in the order that you might use the packages. First, you would choose your securities using a technical or fundamental analysis package. Then you would manage those investments using a portfolio management package.

TECHNICAL ANALYSIS With 25 products covered, technical analysis is the largest category of investment software. Why? First, this technique for analyzing securities is currently one of the hottest on Wall Street. Second, this form of analysis lends itself particularly well to computerization.

The popularity of technical analysis is the result of current market conditions. In recent years, the big-time institutional investors and money managers have been increasingly judged on short-term results. They have been trading securities at a furious pace looking for short-term profits. Technical analysis is designed to help you predict these short-term changes so that you can buy low, sell high, and make a profit. Technicians analyze price movements, volume, trends, and patterns of individual stocks and the overall stock market. This method is based on the assumption that price and volume patterns can be used to predict future price movements.

To visualize these patterns, technicians draw graphs of stock price movements over certain time periods. They also perform calculations on prices and plot them. For example, technicians commonly plot a 50-day moving average of the closing price of a stock or market index. As you can easily imagine, manually calculating and drawing these charts is extremely time consuming.

Technical analysis software can virtually eliminate the time-consuming task of preparing charts. In a matter of minutes, you can automatically retrieve the current and historical price and volume data from an on-line database and create a chart that might include a security's high-low price range, closing price, time frame (hours, days, and weeks), volume, various moving averages, momentum indexes, oscillators, and more.

Technical analysis software lets you not only make money but also save money. You save because you'll no longer have to subscribe to expensive publications containing stock and commodity charts. An added bonus is that your own charts will be much more timely than those in the publications.

FUNDAMENTAL ANALYSIS Fundamental analysis is concerned not with stock price movements but with the underlying or "real" value of companies in terms of cash, assets, and profits. Fundamentalists look for companies whose stock price is a bargain relative to the real value of the company.

■ Technical analysis is designed to help you predict short-term price changes so that you can buy low, sell high, and make a profit.

One of the main ways fundamentalists identify buy and sell opportunities is by examining a group of securities and identifying those meeting a predefined set of criteria. For example, you might look for stocks listed on the New York Stock Exchange with a market price less than book value per share. Or you may want to locate stocks with an increase in sales from the prior year of greater than 10 percent and a market price of less than $20 per share. If you try to find such stocks by looking through newspapers and annual reports, the search could take hours.

In seconds, a stock-screening package can search through a large database of securities and information about them and extract a short, specific list of the stocks meeting the predefined criteria. A stock-screening package can also provide a list of stocks meeting multiple criteria.

In addition to stock-screening software packages, there are a limited number of fundamental analysis software packages that employ a specific approach to analyze the stock market.

PORTFOLIO MANAGEMENT Once you've analyzed stocks and purchased a number that meet either your technical or fundamental criteria, you can use a portfolio management package to keep track of your investment. Portfolio management packages organize key portfolio information and generate a variety of portfolio status reports.

To use one of these portfolio management packages, you enter information on the securities you own or want to follow into one or more portfolios. You price out your holdings by manually entering current security prices or by accessing an on-line service. The package can then generate various reports on your holdings. Typically, these packages can create current portfolio status, profit-and-loss statements, individual security status, dividend income, and interest income reports. In addition, reports often provide advance notice of stock holdings going long term, dividends coming due, and options expiring.

Unlike the packages for investment analysis, software developers target portfolio management packages at either professionals, such as stockbrokers or money managers, or individual investors. The main difference is in the amount of data and number of portfolios that the packages will handle. In the reviews that follow, we therefore identified which products are more appropriate for these groups to make it as easy as possible for you to find the best package for your needs.

USING A SPREADSHEET FOR PORTFOLIO MANAGEMENT In certain cases, you might not want a portfolio management package, for instance, if you've just begun to manage your own portfolio or you haven't found a portfolio package that's flexible enough to suit your needs. If so, you can also use a spreadsheet package for portfolio management.

At the end of the portfolio management section, we've included an article that shows you how to set up a spreadsheet template to monitor your portfolio (see "Using Spreadsheets to Monitor Your Portfolio"). In addition, the article looks at two software packages that you can use to transfer stock prices and other data from an on-line database, such as the Dow Jones News/Retrieval, to a spreadsheet template.

■ We show you how to set up a spreadsheet template to monitor your portfolio.

BONDS We also took a look at software that can be used to analyze the bond markets. In "Software for Financial Security," bond market software is shown to be of great value to the professional investor.

BOOKS Let's face it, many investment software products require that you know quite a lot about investing. Reading a few good books on the subject will certainly get you up to speed. To this end, we devoted our Book Review section to books on computerized investing.

FINALLY In this issue, we've compiled a comprehensive guide to all types of investment software. Once you've determined your own investment strategy, you can use the information in this issue to make a confident decision about which package is the right one to help you control your financial destiny. PC

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WHAT ABOUT ON-LINE SERVICE? *On-line financial services are essential to getting the big financial picture. These services offer instant access to statistics and all kinds of other information. Some even let you query experts and enter your stock orders directly from your PC. With others, you can analyze data on-line without transferring the information to your software package. In the May 27 issue of* PC Magazine *(Volume 5 Number 10), Thomas A. Meyers will review the Dow Jones News/Retrieval service and survey similar services that supplement this household name in on-line finance.*

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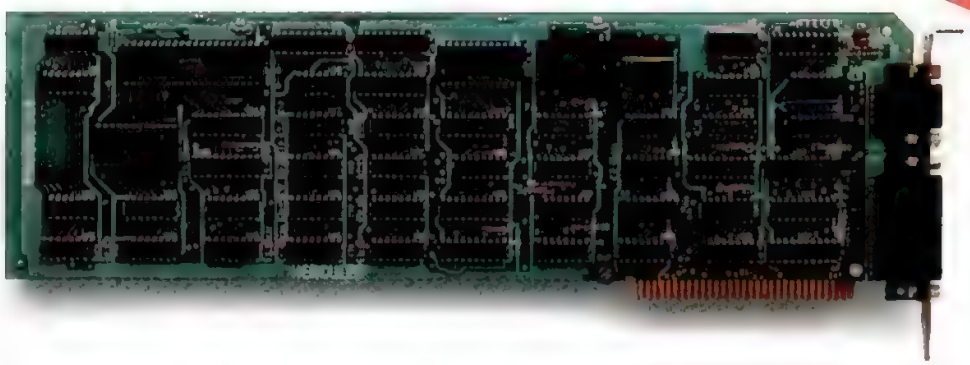
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TECHNICAL ANALYSIS



Experts from Smith Barney test software packages—both good and bad—that take the drudgery out of technical analysis. Now you can say goodby to doing complex calculations and charting data by hand.

"The trend is your friend" is the wisdom on Wall Street. If you purchase stocks during a bull market and then hang on for the ride, you'll make money. But even during relatively flat stretches and especially during volatile periods, you can still outperform the market considerably by buying low and selling high on short-term price fluctuations. The key, of course, is knowing when to buy and sell.

The technical analysis approach to timing purchases of securities can help you time the market. Technical analysis assumes that none of the price fluctuations for an individual stock or the overall market are random. By charting patterns of price movements and volume and looking out for trends, you can optimize your buy and sell timing decisions.

Those "in the know" on Wall Street have turned increasingly to the technical approach in recent years. The big-bucks stock market investors have become more short-term oriented, looking not for long-term gains but short-term profits. As a result, the stock market has become more volatile, with prices rising and falling frequently. Technical analysis can help you reap profits from such short-term volatility.

Technicians use a few basic tools when analyzing stock trends. Charts

show a picture of price movements over time. In addition, technicians perform various studies on price data, massaging and cleaning it to make patterns and trends easier to discern. An example of one such indicator is a moving average, which averages price data over time, smoothing out insignificant movements to clarify real trends.

If you know how to use the charts and studies, you know that you're in for a lot of drudge work, performing complex calculations and plotting price points. Technical analysis software can do this work for you, leaving you more time for the brainwork of analyzing the results.

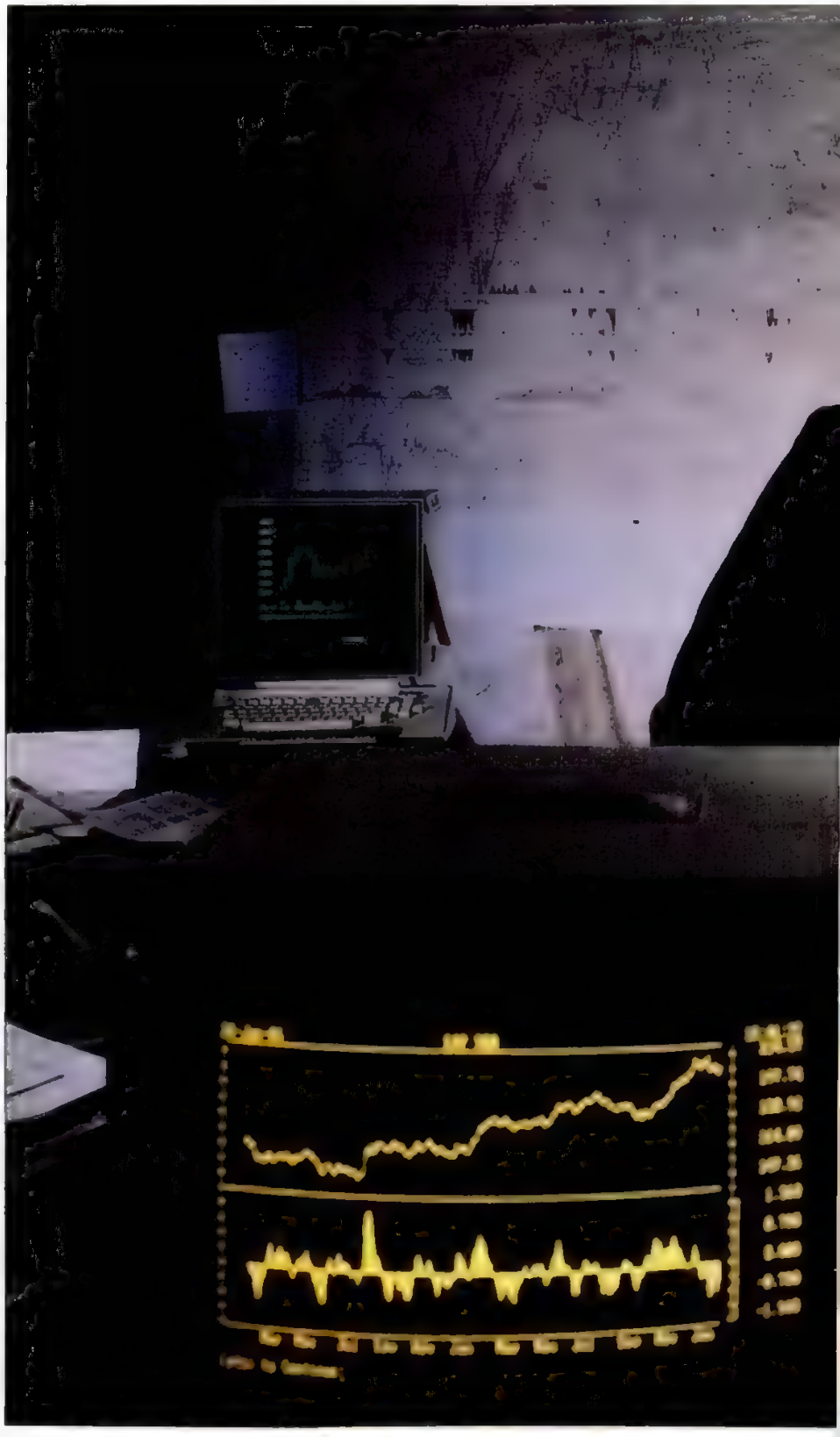
Technical analysis software is usually written with the built-in assumption that you already know the techniques and studies of technical analysis. These techniques

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***Robert W. Colby**, vice president of Smith Barney, Harris Upham & Co. Inc. Technical Research, is the primary author of the firm's* Daily Market Letter. *Colby has been an avid practitioner of technical analysis for 20 years. Having spent many long days in libraries and at the calculator, he is convinced that the PC can greatly facilitate the development of technical theories.*

***Ronald F. Daino** is a technical analyst at Smith Barney. His responsibilities include computer-assisted analysis of the stock market, individual equities, bonds, foreign currencies, metals, and energy.*

***Alan R. Shaw** is a senior vice president and heads the Technical Research Department at Smith Barney. He has practiced technical analysis for close to 30 years. Shaw has lectured around the world and has authored many articles and coauthored textbooks. In addition to classical charting techniques, his group has used computer-generated analysis for 2 decades with the PC playing a larger role in recent years.*





Alan R. Shaw (seated), Ronald F. Daino (left), Robert W. Colby (right)

Photograph: Robert Phillips

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are not unique to professional investors. Thus, the same packages can be used by both professional technicians and the individual investor.

Seasoned technicians argue that the simplest and easiest-to-learn technical analysis tools, such as various types of moving averages, are some of the best. By reading a good textbook, for example *Technical Analysis Explained* by Martin J. Pring (McGraw-Hill), as well as the tutorial explanations provided later in this article, you'll know enough to start using some of the technical analysis packages reviewed here.

■ Some technical analysis packages offer black box indicators that claim to tell you when to buy or sell with little knowledge or effort on your part.

With this background, you'll find packages on the market that will help even novice technicians sharpen their analysis skills. A package like *The Technician*, an Editor's Choice, from Computer Asset Management, is both easy to use and includes a detailed section explaining how to interpret many technical analysis studies and indicators. As you move up the learning curve, you'll find a wide variety of technical analysis packages. One is sure to mesh with your particular investment objectives.

To make your search easier, we asked the technical research department at Smith Barney, Harris Upham & Co. Inc. to evaluate the technical analysis packages available. With their vast experience in technical research, they were able to pinpoint what makes each package unique and test how well it accomplishes its objective. They tested each package's ease of use and the synergy among all its parts. They also looked into the reliability of the packages' studies and indicators. Even if you're not quite ready to purchase a package for technical analysis, just reading Smith Barney's reviews is itself an education in the methods and nuances of technical research.

A VARIETY OF PACKAGES In addition to packages for the novice computer user, Smith Barney uncovered packages that are excellent for experienced technicians. One of the most expensive technical analysis packages on the market, *Compu Trac*—one of the Editor's Choices—is also one of the most useful to the technician. *Compu Trac* is sold on a subscription basis. Subscribers receive periodic updates that include new features and studies. This is particularly useful because a good technician must stay closely attuned to the market, changing strategies with its changing tides.

Other packages, like *Swing Trader* and *The Profit Optimizer*, allow you to backtest trading strategies. The assumption is that if a particular study could have closely predicted what would have happened on past data, over various time periods, it may also predict what will happen in the future. This is a particularly apt use for the PC because of the thousands of calculations involved in this type of testing.

Still other packages offer black box indicators that claim to tell you when to buy or sell with little knowledge or effort on your part. The logical question is, "If the technique is so good, why do you want anyone else to know about it?" This question reflects not only healthy skepticism but the fact that if too many people use a particular strategy, the strategy will influence the market, thus losing its effectiveness. In addition, many of these black boxes have not been thoroughly tested according to accepted technical analysis standards. Our reviewers have taken care to warn you about such suspect studies and indicators.

Finally, some of the packages simply don't live up to their promises, are awkward to use, and offer few indicators. We've warned you about these as well.

IMPORTANT FEATURES A number of features, working together, determine the overall effectiveness of a technical analysis package. The type of data required, the source of data, and how you enter it into the package, for example, are significant factors in the type of analysis you can perform with a technical analysis package. Some studies require specific types of data. To perform relative-strength

PC MAGAZINE EDITOR'S CHOICE

Established in 1979, Compu Trac Inc. is probably the oldest and largest technical analysis software vendor. And ***Compu Trac*** *is the standard of excellence in the technical analysis field. With more than 30 indicator studies, a wide variety of graphics tools, and the best profitability tester we've seen,* Compu Trac *is the most comprehensive technical analysis package available. Because it is sold on a subscription basis,* Compu Trac *can also offer periodic updates with the latest technical analysis tools. If price is no object—it sells for $1,900—and you're willing to spend the time to learn its complex functions,* Compu Trac *is clearly the package of choice for the serious technical analyst.*

Computer Asset Management's ***MetaStock*** *for analyzing individual securities offers superior, flexible graphics, has a well-written manual with extensive explanations of technical analysis concepts and terms, and allows you to access seven online databases. Novices and experts in computer use and in technical analysis will find* Meta Stock *fast and easy. At only $195,* MetaStock *is an affordable choice.*

If you want to follow a wide variety of technical indicators on the general stock market and also want a package that's easy to use, ***The Technician*** *from Computer Asset Management is for you. The package includes an extensive database of historical data, as well as flexible and varied features for charting that data. And for novice technicians the manual provides extensive explanations of indicators.*

analysis to determine how a particular stock compares with the overall market, for example, you need to employ the generally used standard of comparison, the Standard and Poor's 500 Index. If you can't get that data, you can't do the study. Most technical analysis packages require you to input vast quantities of data for plotting in charts. For instance, a basic high-low-close bar chart for IBM for a 90-day period requires 450 items of data.

Although you can manually key in this data, most programs save you the trouble by accessing an on-line service, such as the Dow Jones News/Retrieval, from which you can download the required data. If you desire, you can use your time savings to track more stocks.

Charting is practically the raison d'être for most technical analysis packages. A package that takes advantage of your PC's color/graphics capabilities will make it easier for you to distinguish between securities and technical indicators when you plot more than one on a single chart. You might want to compare one or two stocks to an index or examine several technical indicators at the same time. The ability to display multiple charts on the screen in such cases is helpful.

Often a package comes close, but not close enough, to meeting your analysis needs. If so, look for a feature allowing you to enter customized formulas for performing calculations on price data and for charting. This feature will let you fashion the package to suit your needs exactly.

A few packages have a zoom feature, allowing you to zoom in to take a closer look at a segment of a chart and zoom out to examine more data on the screen.

Often, you'll find yourself preparing the same charts day after day. If that's your problem, an autorun feature is a great time saver because it enables you to define a series of charts that will be prepared and printed automatically each day at the touch of a key.

Our reviewers also took a look at whether or not you can specify the number of data points plotted and scale ranges, enter horizontal and vertical titles, and add horizontal and vertical grid lines. And, finally, they evaluated product support, documentation, and overall ease of use of each package.

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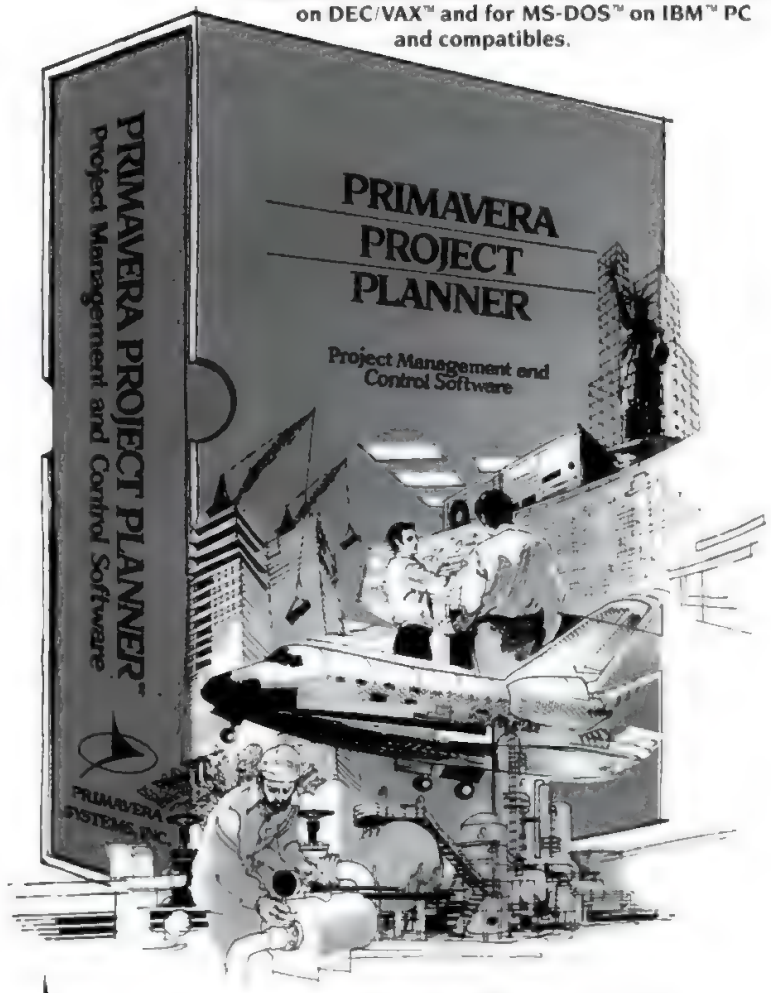
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A TECHNICAL ANALYSIS TUTORIAL

While technical analysis software helps you prepare charts, a good package will not claim to make a decision for you. Therefore, you must interpret the charts and decide what and when to buy or sell. If you're unfamiliar with technical analysis techniques, this overview of currently accepted technical analysis tools and techniques and the glossary will help you. That should give you enough information to decide which packages you want to use or whether you want to use the technical approach at all.

BAR CHARTS The technician's primary tool is a "picture," or chart, of a stock's price movement. Bar charts are by far the most common type of price chart. In a bar chart, a vertical line that ranges from the period's lowest price to its highest price represents each time period. A horizontal protrusion marks the period's closing price.

The length of the period used for a bar chart can vary depending on whether you are oriented to short-term, intermediate-term, or long-term investments. Although there is no generally accepted definition of these three terms, short term roughly refers to the next 3 months; intermediate term is about 3 to 6 months from the present time; and long term is considered to be approximately 6 months to 1 year from the current period.

Technicians often use hourly and daily bar charts to determine the short-term trend of stock price movements. They use weekly charts for gaining an intermediate-term perspective. And monthly and yearly charts help technicians examine the long term.

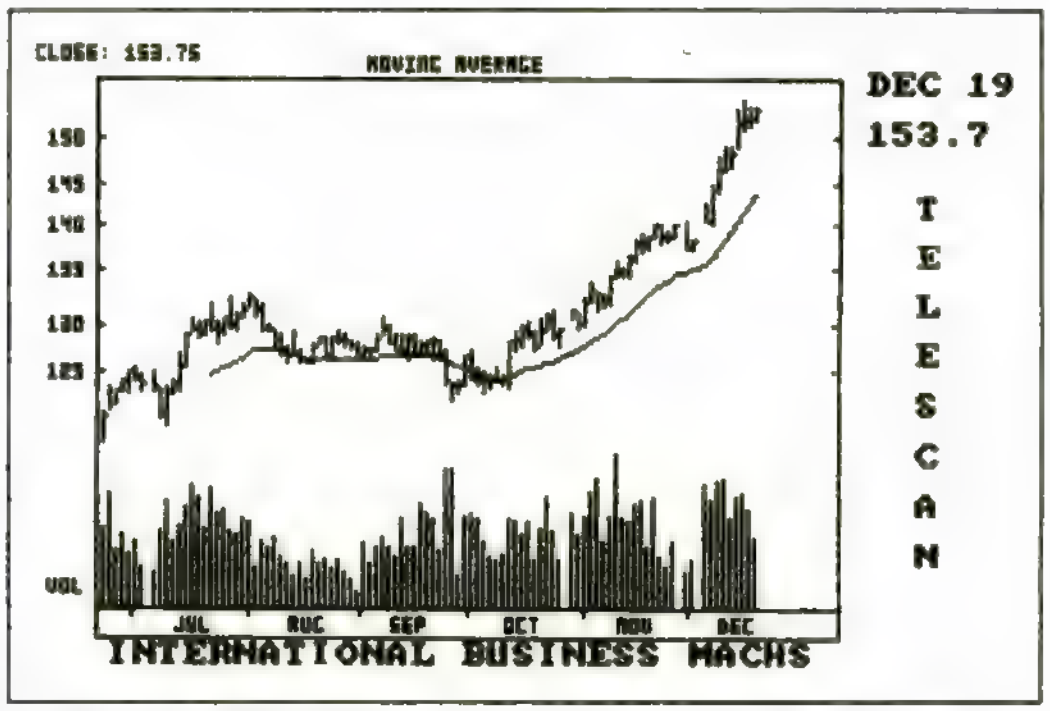


Figure 2: *A 6-month bar chart for IBM with a 20-day moving average. From October on, the short-term trend is clearly up.*

By looking at a bar chart, the technician can quickly discover trends in the stock's price movement. Let's look at two sample bar charts—one long term and the other short term.

Figure 1 shows 12 years of price and volume activity for IBM. At the beginning of the period, 1973 to mid-1974, the stock was clearly in a downtrend. After a short uptrend during 1975, the stock's price trend was basically sideways until the end of 1981. Since that time, IBM has been in a strong uptrend with a little sideways movement during 1983 and 1984. Based on this chart, you would conclude that the long-term trend for IBM is up.

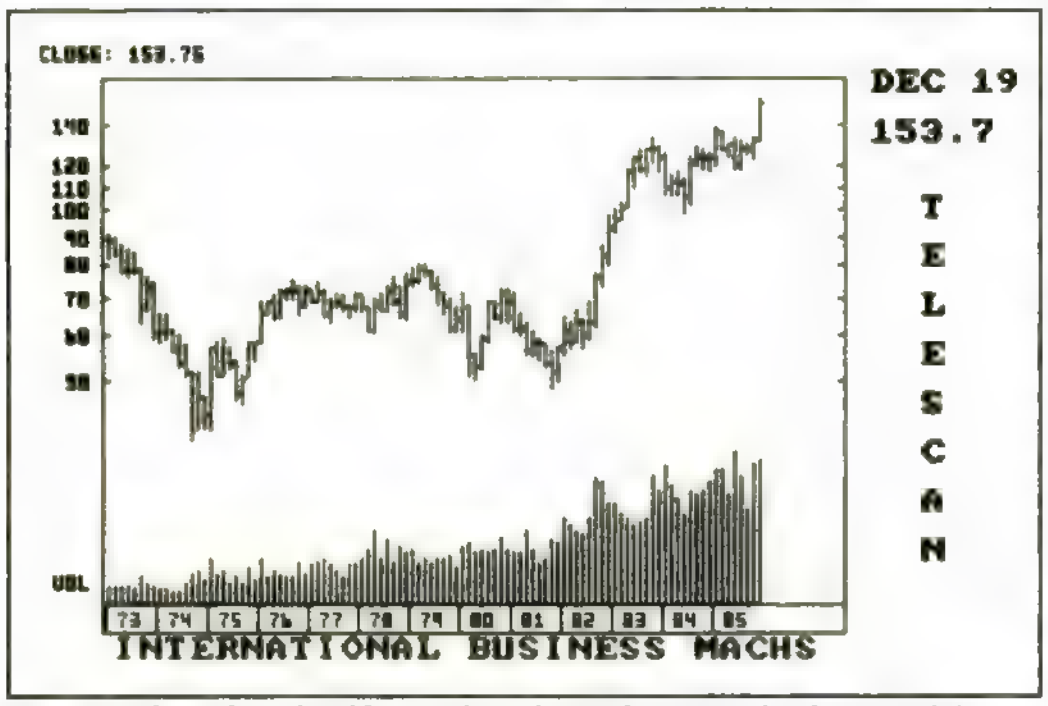


Figure 1: *Based on this 12-year bar chart of price and volume activity for IBM, you would conclude that the long-term trend for IBM is up.*

Figure 2 reveals IBM's short-term chart, which is a daily bar chart plotting a 6-month period. Between the middle of June and the beginning of October, IBM moved sideways, with no clear direction—up or down—indicated. However, since the beginning of October, the price has shot up from about $125 to over $150 per share. Even at a glance, the short-term trend is clearly up.

VOLUME Notice the volume histogram at the bottom of both Figure 1 and Figure 2. Volume, the total number of shares traded during a given time period, is commonly shown at the bottom of a bar chart. A stock's price that rises or falls along with a corresponding rise or fall in the volume is seen as a sign of the strength of the movement. Rising volume on a decline in price and declining volume on an advance in price is a sign of weakness. Moreover, traders think that up or down movements in a stock's price during a period of low volume are not significant, while price fluctuations during a period of high volume are. Traders often monitor volume as a leading indicator because volume trends tend to reverse before price trends.

In addition to volume, other technical indicators are often plotted, such as moving averages, oscillators, momentum (rate of change), and relative strength.

MOVING AVERAGES Moving averages are often used to smooth price fluctuations, giving a clearer picture of a stock's price trend. A moving average, as its name implies, is an average that moves with the period of time covered. For example, you calculate a 10-day moving average by adding all the stock's closing prices for each of the last 10 days, then divide by 10. Each day, you add the latest day's price, subtract the price for 10 days ago, and divide the new total by 10.

Technicians use different time frames for moving averages. They might, for example, use 10-day, 50-day, and 200-day moving averages for short-term, intermediate-term, and long-term analysis, respectively.

As a rule of thumb, as long as a stock's price is above its moving-average line, the outlook for that stock is bullish. On the other hand, a stock price that is below its moving-average line is a bearish sign. Figure 2 shows a 20-day moving-average line for IBM.

RELATIVE STRENGTH Relative strength is another frequently used technical indicator. Relative strength compares the performance of a stock with that of another stock, an industry group, or an overall market index, such as the Standard & Poor's 500 Index. If you chart a stock's relative strength compared with the Standard & Poor's 500 Index, you can see whether or not the stock is moving up or down at the same pace as the overall stock market. Ideally, you want to locate stocks that outperform, that is, move up faster than the overall market.

INDIVIDUAL SECURITY INDICATORS You can use a wide range of other sophisticated indicators to analyze individual securities. These include commodity channel index and commodity selection index for performing technical analysis on commodities, demand index, detrend, directional movement index, HAL momentum index, momentum, on-balance volume, oscillator, parabolic, rate of change, stochastic, volume accumulation, Williams's percent R, and many others. You use three basic items to calculate each indicator: price, volume, and, in the case of some commodities and futures, open interest.

OVERALL MARKET INDICATORS In addition to the indicators used to analyze individual securities, a large body of technical market indicators help you evaluate the trend of the overall stock market.

It is widely recognized that most stocks move in the same direction as the overall stock market. If the market is moving up, the majority of stocks will move up; and the converse is also true. Because of this correlation, most Wall Street analysts believe that determining the trend of the overall stock market is essential to successful investing.

Technical market indicators are normally divided into three types, which are called momentum, sentiment, and monetary.

MOMENTUM INDICATORS Momentum indicators show market strength and weakness and include rate of change, advance/decline, volume, and new highs/lows indicators.

SENTIMENT INDICATORS Sentiment indicators examine investor expectations and their opinions regarding the stock market. The premise behind sentiment indicators is that the small investor is usually wrong about the direction that the stock market is about to take; therefore, technicians use these indicators as contrary indicators. That is, if a sentiment indicator reveals that individual investors believe that the stock market will go up, the market is likely to fall. Popular sentiment indicators include short sales, odd-lot trades, and put/call ratios.

MONETARY INDICATORS Monetary indicators are based on the concept that an inverse relationship exists between interest rates and the stock market. The logic is that investors want their money in the vehicle most likely to yield the greatest return. If interest rates decline, as they have recently, the yield from investments such as money market funds and certificates of deposit also declines.

Therefore, stocks become more attractive as the likelihood increases that their return on investment will be greater than for interest-bearing investments.

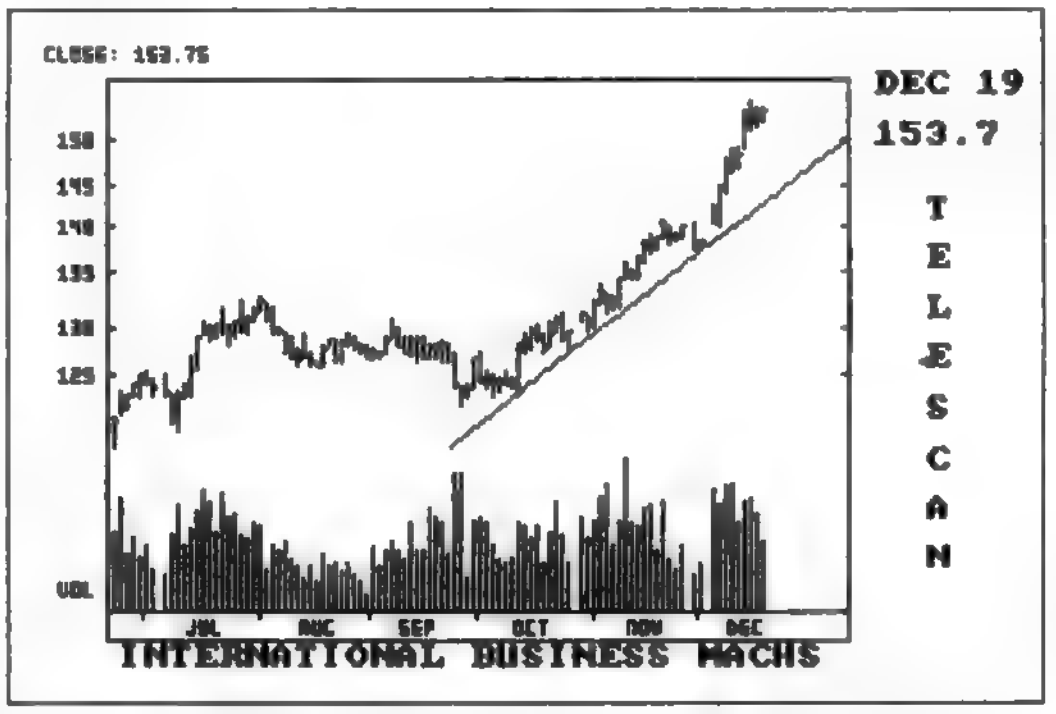


Figure 3: *A 6-month bar chart for IBM with a trend line. Trend lines are very reliable tools for predicting trend reversals.*

TREND LINES Technicians use a variety of chart analysis tools in conjunction with bar charts and indicator charts. These include trend lines, parallel trend lines, support and resistance lines, ⅓ to ⅔ speed resistance lines, trading bands (also known as envelopes), and cycles.

Of these charting tools, the trend line is the most widely used. A trend line connects a series of stock prices, tops or bottoms, by a straight line as illustrated in Figure 3. These lines are simple but important chart analysis tools because they are reliable much of the time in predicting reversals in stock trends, signalling when it's opportune to buy or sell. A reversal in a stock trend is indicated when the trend line is penetrated significantly.

AND ON TO THE REVIEWS Now you're armed with some background material. The reviews that follow highlight the key features and functions of each technical analysis package. Our reviewers have been careful to point out the packages' strengths and weaknesses to you and give a complete picture of the value of each package to the technically orientated investor.

TECHNICAL ANALYSIS
G L O S S A R Y O F T E R M S

Bottom A low for a stock or the overall market.

Breakout A substantial rise in price above a resistance level or decline in price below a support level. When a breakout occurs, a price trend is likely to continue.

Cycle A price pattern or movement that regularly occurs in a given time interval.

High-low-close bar chart A chart of price versus time. The vertical axis indicates price; time intervals are marked on the horizontal axis. For each time period (usually daily or weekly), a vertical line denotes the high and low price of the security; a short horizontal line shows the closing price.

Momentum The rate of expansion of a security's price or volume.

Moving averages A tool used to smooth price fluctuations, allowing you to better determine price trends.

Moving averages, simple Calculated by adding data, usually daily or weekly, for a set period of time and dividing the total by the number of periods.

Moving averages, weighted Calculated by averaging data over a set period of time, giving more emphasis to the most recent data.

Moving averages, exponential Calculated by multiplying the difference between the current period's price and the exponential moving average for the previous period by an exponent, which varies depending on the length of the moving average. You then add the product of that calculation to the previous exponential moving average to arrive at the current period's exponential moving average.

On-balance volume (OBV) A technical indicator that manipulates volume figures. If the stock price falls to a new low and the OBV does not, the indicator is interpreted as being a positive sign; if the stock price rises to a new high and the OBV does not, the indicator is interpreted as being negative.

Optimization A test performed on historical data to determine which indicators would have resulted in the maximum profit during a given period of time.

Oscillator The difference between two moving averages.

Overbought The point (after a period of vigorous buying) at which upward momentum in prices can no longer be maintained, and prices can be expected to stabilize or decline.

Oversold The opposite of overbought. It is a point at which downward momentum in prices can no longer be maintained and prices can be expected to remain stable or rise.

Point and figure chart Records price activity without reference to time and volume. These charts are used to determine the trend in a security's price.

Relative strength A comparison of the performance of an individual stock or group of stocks to the overall market. Relative strength analysis helps select stocks that are likely to outperform the overall market.

Resistance level The price at which sellers tend to sell in sufficient volume to lower the price of a security. For example, if on five occasions the price of a given stock has risen to around $50 per share and, on each occasion, the price has subsequently dropped, a technical analyst would consider $50 per share to be a resistance level for that stock.

Support level The price at which buyers tend to buy in sufficient volume to raise the price of a given security.

Technical analysis The study of stocks and the overall market based on supply and demand. Technical analysts use charts of historical price and volume activity to predict future price movements.

Technical indicator A simple data series or a complex formula that manipulates data to forecast the direction of a stock or the overall market.

Top A high for a stock or the overall market.

Trading band Contains normal price fluctuations. It is shown graphically as parallel lines at certain percentage points above and below a graph of an indicator or study. If the indicator goes outside the band, the strength or weakness of the trend is extraordinary. Also known as an envelope.

Trend The trend is the direction of a price movement.

Trend line A straight line on a chart that connects consecutive tops or consecutive bottoms of prices. Trend lines are used to identify levels of support and resistance.

Volume histogram Usually accompanies a high-low-close bar chart. Volume is shown at the bottom of the chart by a vertical bar under each period's price data. PC

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CIRCLE 218 ON READER SERVICE CARD

ADVANCED CHARTIST



Since PCs and PC software are evolving rapidly, with new advances each month, products considered good 2 or 3 years ago now seem clumsy and outdated. When Pardo Corp. introduced *Advanced Chartist*, Version 1.0, in April 1983, the program was considered a good charting program, fancier than some but standard and reliable. Today, though, Version 1.0 of *Advanced Chartist* seems far from advanced. In fact, compared with new programs on the market, it's slow, inflexible, and relatively awkward to use.

Fortunately, a new version—2.1—is due to be released any day now. If the new *Advanced Chartist* performs as well as expected, it should be a very strong competitor in the investment software market.

Since a copy of the new version of *Advanced Chartist* was not available for review in this issue, we looked at the old version to tell you what it offers. We also describe what the vendor promises for the new version of the program.

INSTALLATION AND DATA ENTRY Installing the copy-protected software is easy with two floppies but complicated with a hard disk. With a system that uses two floppy disks, you simply put the program disk in drive A: and follow the simple directions. If you're using a hard disk, you'll first need to install a *Prolock* "fingerprint" on it.

Version 1.0 of the program accesses the Commodity Systems Inc. (CSI) database, and the new version will, according to the vendor, access eight to ten other on-line databases as well, including Dow Jones News/Retrieval, CompuServe, Warner Computer Systems, Remote Computing, and others. You can use the data vendor's software to update your data automatically, or you can enter the data by hand.

STUDIES AND TOOLS The old version of *Advanced Chartist*, now outdated, offers only a fair variety of studies and tools. The primary price chart is the standard arithmetic-scale bar chart displayed in time intervals up to 240 periods (days, weeks, or months). In addition, you can choose to display volume histograms, open interest for futures, simple moving averages, Wilder's Relative Strength Index, and on-balance volume.

A graphics tools menu gives you the choice of drawing lines, parallels, perpendiculars, angles, measurements, retracements, Fibonacci projections, or circles. The more complex graphics studies menu enables you to draw Gann angles and lines; Fibonacci fans, arcs, and spheres; retracements; speed lines; the Pentagon; MLR lines; and time × space. An autorun feature saves you time when you are doing your update routine.

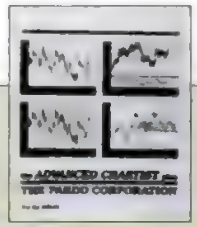
Version 1.0 of *Advanced Chartist* lacks some important indicators, you can't change the scales to suit your needs, and the program is slow and clumsy. In sum, this version of *Advanced Chartist* doesn't really do much when compared with other, newer programs on the market, and when it comes to performance, it's behind the times.

NEW VERSION But, if you can believe the claims of the vendor, the new version of the program—*Advanced Chartist* 2.1—promises a lot more flexibility and features. According to Pardo Corp., the most important new attributes will be a windowing capability (with eight windows), the capacity to let you change scales any way you want, and the speed of machine language programming.

New features that Pardo says Version 2.1 will offer include spreads, multiple screens, multiple histories on the same screen, comprehensive price scaling, point and figure charts, swing charts, filtered swing charts, a notepad subsystem, and a slide-show subsystem. Moreover, a broad new selection of programmable indicators are promised, including various oscillators, rate of change, Williams's percent R, stochastics, detrending, various price bands, spectral analysis, and regression analysis.

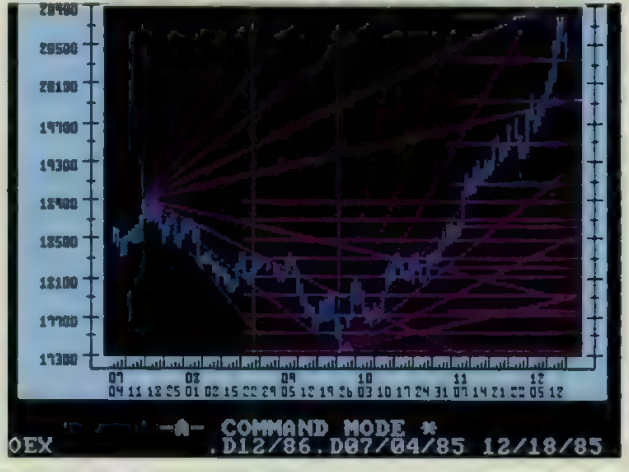
The claims of new indicators and multiple screens are more likely to pan out than some others, for without them the new version would not be able to compete with other charting programs now available. But until we see the new product and test it, we can't really say if Pardo's promises will come true. In particular, we'll have to see proof of the claim that the new graphics

PC MAGAZINE FACT FILE



Advanced Chartist
Pardo Corp
1615 Ormington, #C202; Evanston, IL 60201; (312) 866-9342
List Price: $495 **Requires:** 256K RAM, color/graphics adapter, DOS 2.0 or later; modem and printer recommended.
In Short: Version 1.0 of this standard charting program is now merely fair to good at best, but the vendor promises new capabilities in a soon-to-be-released update.

CIRCLE 670 ON READER SERVICE CARD



While you can draw Gann lines and angles with Advanced Chartist, *the package lacks some important indicators.*

will be able to display 17 years of daily data (much more than any other program on the market) before we can believe it.

Pardo Corp. sells *Advanced Chartist* separately or packaged with *Swing Trader* (see review in this issue). Although Version 1.0 of the program is now outdated, Version 2.1 sounds most interesting. We're looking forward to seeing what it can really do.—**Robert W. Colby**

CHART TRADER PLUS



Chart Trader Plus from Investor's Toolkit Ltd. is an easy-to-use package with a couple of fancy studies.

The more exotic tools, out of a total of 20 indicator studies, include median lines of resistance (also known as Andrews's pitchfork, a channeling system), Fibonacci speed resistance lines, Fibonacci spheres, recursion lines, and percentage retracements.

The package also plots many simple moving averages (no weighted or exponentials) with trading bands around them, and oscillators of the difference between two moving averages. It also offers several other momentum studies such as user-specified, period-to-period rates of change of price and Wilder's Relative Strength Index (RSI). On-balance volume, Williams's close-open/high-low times volume, and Williams's percent R are available, along with ordinary volume and open-interest displays. You can set cycle intervals and draw trend lines and parallel channels.

You can access price data by modem through Commodity Systems Inc. or the National Computer Network, or you can enter data manually.

PRETTY COLORS The nicest thing about *Chart Trader Plus*'s graphs is their color. However, the package does not include its own charting function; all graphs are standard DOS graphics in medium resolution.

You can plot charts and print them for stocks, indexes, and futures for a maximum of 280 periods (daily, weekly, or monthly). But you can change neither the labels nor the scales (which are arithmetic) on the charts' axes. The package does not include semilog scaling. Only the lowest and highest points on the price scale are labeled with a number, moreover, so you'll have to use a ruler and some ingenuity to decipher the value of points (or rather hash marks) on the graph. The package does not offer a zoom feature to help you examine the charts more closely. In sum, these are not the best graphics you'll ever see.

BRIEF MANUAL Although the brief user manual adequately describes the programs' operation, it lacks error message explanations and an index. Like the manuals of many other products of its type, it doesn't give you a clue as to how to use and interpret the indicators, although an appendix does offer a three-page bibliography. Installing the package is fairly easy. You just copy DOS onto the program disk.

In conclusion, for a list price of $299.95, *Chart Trader Plus* offers a fair assortment of indicator studies charted in attractive colors. It is fairly easy to use, but lacks flexibility in graphing indicators. You'll probably be able to find better programs without much trouble.
—**Robert W. Colby**

PC MAGAZINE FACT FILE



Chart Trader Plus
Investor's Toolkit Ltd.
7441 W. Archer Ave.; Summit, IL 60501; (312) 761-3080, for information; (312) 496-0305, orders only
List Price: $299.95 **Requires:** 128K RAM, one double-sided disk drive, color graphics card, DOS 2.0 or later.
In Short: Has a fair number of indicators, is easy to use, but lacks flexibility in graphing.
CIRCLE **669** ON READER SERVICE CARD

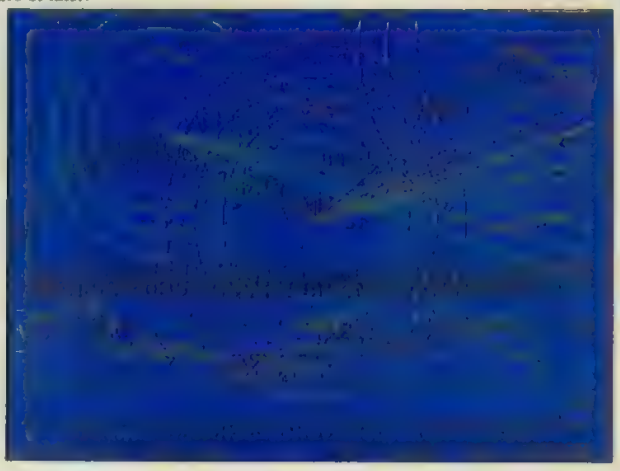


Chart Trader Plus *offers a couple of fancy studies, including Fibonacci spheres, as shown here.*

COMPU-CAST



According to the manufacturer, *Compu-Cast* is a "powerful, computer-directed, security analyzing, charting, and editing program." Moreover, it promises "great flexibility." But the product simply doesn't deliver as promised.

The most shocking deficiency is the absence of any real graphics capabilities other than a very crude display of "." and "+" symbols on the screen and printer. These displays are limited to charting 78 trading days—considerably less than similar programs that typically chart from 200 to 500 days. The scales and labeling of these displays are indistinct and nearly useless. Finally, you have absolutely no flexibility to change a chart.

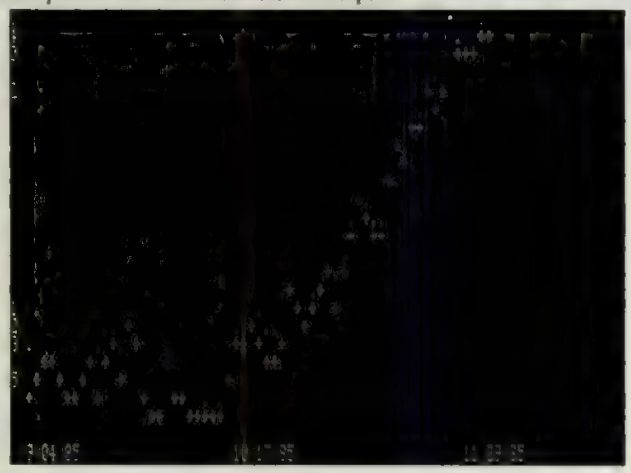
The only function of any possible value in *Compu-Cast* is a vague "black-box" indicator with a secret formula called Security Pressure. The vendor claims that Securi-

PC MAGAZINE FACT FILE



Compu-Cast
Compu-Cast Corp.
1015 Gayley Ave., #506; Los Angeles, CA 90024; (213) 476-4682
List Price: $325 for a copyable version, $275 for a copy-protected version.
Requires: 64K RAM, one double-sided disk drive, DOS 2.0 or later.
In Short: An extremely limited product that is difficult to use and has poor graphics capabilities. Some of its indicators are questionable.

CIRCLE **658** ON READER SERVICE CARD



Compu-Cast *represents closing prices with a "." and security pressure as a "+"*

ty Pressure quantifies buying and selling pressures based on the premise that volume normally increases at or near the bottom and top of a trend. Because the vendor does not disclose the formula for this indicator, it is difficult to judge its validity. When Security Pressure (symbolized by a "+") diverges from the closing price of the security (symbolized by a "."), you are supposed to anticipate a change in the price trend. This idea *may* have some merit, but like most chart reading it leaves plenty of room for subjective interpretation by the user and possible confusion.

QUESTIONABLE ASSUMPTION *Compu-Cast* calculates very crude time cycle turning points (after you specify the length of the cycle) and possible price objectives (prices at which you should buy or sell stocks). This study is based on generally accepted percentage retracements and swing repetitions. *Compu-Cast*'s Price-Time Prediction is based on the questionable assumption that the last swing will be repeated *exactly*. In fact, the vendor says that "most up and down movements of a security generally follow approximately the same slope." If only it were so easy!

A Security Alert will report on unusual trading volume (50 percent above average) or unusual Security Pressure/Price Activity. *Compu-Cast* spots what the vendor calls "a significant difference"—whatever that means. Of course, these indicators would be obvious even without *Compu-Cast*, so these features seem to be of little real value.

POOR DESIGN *Compu-Cast* is awkward, slow, cumbersome, and unforgiving of keystroke errors. There is no provision for changing your mind once you've given the program a command. The manual is irritatingly vague and poorly organized.

Compu-Cast will not select securities for you, so the vendor suggests that you also buy a good, long-range chart service to help locate securities of interest. While you're at it, you might as well go to a market advisory service that has a good record of forecasting the market turns and can also assist you in selecting your securities. Then you can spare yourself the agony of trying to use *Compu-Cast*.

The program is extremely limited and demands that you learn a new, unidentified, and questionably valid indicator. Its graphics are inflexible and well below standard, and it is not easy to use. Overall, *Compu-Cast* does not hold a candle to competing products.—**Robert W. Colby**

★ EDITOR'S CHOICE

COMPU TRAC



If you're an investment professional or a serious amateur who demands the very best tools and is willing to pay top dollar for them, you'll want to use *Compu Trac*. At $1,900, plus $300 annual maintenance fee for periodic software updates, a newsletter, and telephone support, *Compu Trac* is expensive, perhaps the most expensive technical analysis package on the market. But it's also, quite clearly, the best one on the market, setting the standard of excellence against which to measure other programs.

Compu Trac Inc., probably the oldest and largest technical analysis software vendor, was launched in 1979 when 30 or so futures traders formed a technical analysis group to share ideas and expenses for developing software for the then-new PC. By October 1985 the group had 4,300 subscribers. Recently, Telerate Systems, a financial data and information company, purchased Compu Trac Inc., hoping to form a stronger backing to protect the $1,900 investment of *Compu Trac* subscribers.

A VARIETY OF STUDIES *Compu Trac* can handle data for stocks, futures, options, and bonds as well as data on the economy, advances and declines, put and call volume, and so forth. The program offers more than 30 indicator studies, including moving averages, rates of change, oscillators, ratios and spreads, Wilder's Relative Strength Index, stochastic, on-balance volume, Appel's Moving Average Convergence/Divergence Trading Method, Sibbet's Demand Index, point and figure, and many others. In addition, you can create your own studies.

Moreover, you can choose a wide variety of graphics tools, including zooming in

and out, changing scales to anything within reason, switching from arithmetic to semilog scaling, changing screen resolution from high-resolution monochrome to medium-resolution color, placing grid markers on the screen, drawing trend lines and parallel channels, creating Andrews's pitchfork as well as Fibonacci fan lines, arcs, and time zones, finding cycles with Fourier analysis, and charting Arm's equivolume price/volume.

One of *Compu Trac*'s most powerful features is its distinctive Profitability Editor, which can automatically test and optimize trading decisions for profitability over historical price data. You specify entry and exit rules, moving stop-loss levels for minimizing risk, and commissions and slippage trading costs. Once you set it up, *Compu Trac* calculates the results, taking only a few minutes to do a relatively simple test. You can stimulate a trading strategy over a variety of past market conditions to quantify performance. Profit and loss and the number of trades give you a clear picture of how a strategy might perform in the future.

Compu Trac's Profitability Editor works in conjunction with an autorun feature to find "optimum" decision rules: It repeatedly tests a strategy with slightly different parameter settings each time to identify which one would have performed best over the 510 historical periods loaded into memory. The autorun feature is also useful for quickly and effortlessly producing your favorite routine studies day after day.

INSTALLATION AND DOCUMENTATION The *Compu Trac* package is quite comprehensive. Consequently, it is also complex, and so learning to use it may take you quite some time—at least 1 week, perhaps more than 2 weeks, depending on your experience.

Installing the program is the most difficult part of learning to use it; the rest is difficult but not too complex. Although you can copy the *Compu Trac* software disks, they won't operate unless you install a special "security card" inside your PC. In addition, the program is so large that it takes up to two double-sided floppy disks; if you have two floppy disk drives, you'll have to switch disks often while running *Compu Trac*. The program is easier to use with a hard disk.

Compu Trac's 316-page manual and its telephone support are both very good. A tutorial helps you get started using the program, but the large quantity of material you'll need to know takes time to learn.

DOWNLOAD WITH EASE You can input and edit data for stocks, futures, options, bonds, and so forth, by hand or automatically with a modem accessing an on-line database. Because of the large number of users, many on-line databases download data in *Compu Trac* data format, including Commodity Systems Inc., IDC Price, Interactive Data Corp., National Computer Network, I.P. Sharp Associates, Sharp, Remote Computing, CompuServe, Dow Jones News/Retrieval, and Warner Computer Systems.

Compu Trac can handle hourly, daily, weekly, monthly, quarterly, and annual data periods, and it can compress (or transform) daily data into weekly or monthly periods. Thus, although you can display a maximum of 510 periods (about 2 years of daily data) on the screen at a time, the 510-period limitation translates into 42 years of monthly data.

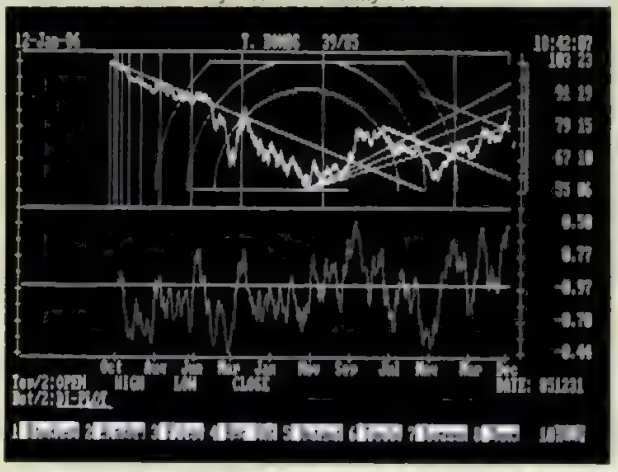
COMPLEX BUT SUPERIOR *Compu Trac* is the most comprehensive, powerful, and flexible technical analysis program available. It is also complex, requiring you to spend weeks or even months to become proficient. If your needs are simple or your learning time (or patience) limited, you might be better off with a less sophisticated package at a fraction of the cost. But if you're a serious technical analyst and want a superior product, *Compu Trac* is most likely the right choice.

—Robert W. Colby

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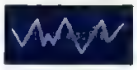
Compu Trac
Compu Trac Inc.
P.O. Box 15951; 1021 Ninth St.; New Orleans, LA 70175; (504) 899-1277
List Price: $1,900 **Requires:** 384K RAM, two double-sided disk drives, color graphics, DOS 2.1 or later; modem and printer recommended.
In Short: The standard of excellence in technical analysis; its Profitability Editor is the best automatic profit-testing routine we've seen.

CIRCLE 682 ON READER SERVICE CARD



Compu Trac offers a wide variety of studies, such as Andrews's pitchfork and others shown here.

DOW JONES MARKET ANALYZER



Introduced for the IBM PC in early 1983, the *Dow Jones Market Analyzer* was one of the first packages to feature stock price charting capabilities and some of the classic technical indicators, but it lacks many of the latest technical

tools. A new Dow Jones package, *Market Analyzer PLUS* (reviewed in this issue) offers some improvements, but Dow Jones will market the two packages separately.

The *Market Analyzer* does include arithmetic and semilog charting scales, the latter of which clearly shows the actual percentage change in prices. Moving averages are well represented, giving you a choice of either simple, weighted, exponential, or modified versions. The *Market Analyzer* also gives you a choice of drawing standard trend lines, horizontal lines to establish support and resistance areas, ⅓ and ⅔ speed resistance lines, and trading bands, and the ability to change the chart's scale both horizontally and vertically.

In addition, several volume indicators are offered, such as negative volume, positive volume, cumulative volume, price volume trends, and daily volume, as is the ability to create a volume line chart. Oscillators give you yet another tool for "momentum" analysis.

Unfortunately, such basic analysis tools as rate of change calculations are not available with the program, and the absence of such popular indicators as the Relative Strength Index (RSI) and stochastic oscillators is disappointing.

For the busy technician, the program's autorun feature lets you automatically create a whole series of studies on an individual stock or a group of stocks.

ON-LINE ACCESS To obtain stock price quotes, the *Market Analyzer* accesses only the Dow Jones News/Retrieval database, which classifies the quotes into two categories, current and historical. These categories apply to market averages (only Dow Jones averages) as well as to individual equities. However, you can obtain historical quotes for only 1 year of daily data—hardly enough to obtain a good long-term perspective of price trends. Also, you can't access weekly or monthly data via modem.

The only general market price indexes available for analysis are the Dow Jones industrials, transports, utilities, and the Dow 65 stock composite. While these indicators are widely followed, the exclusion of the broader market averages, namely the Standard and Poor's 500 Index, New York Stock Exchange Composite Index, and Value Line, may be limiting. For example, in relative-strength analysis, in which you take the individual stock price and compare it with the average, the generally accepted standard of comparison is the Standard & Poor's 500. The *Market Analyzer* only allows you to use the Dow Jones averages, which may result in some variation in results because the Dow Jones doesn't represent the broad market.

The *Market Analyzer* allows you to chart stocks for any length of time, up to 228 days, but the charts are difficult to read because the package only prints the first and last dates and the highest and lowest prices. Thus, you have to draw in your own lines or guess at the coordinates of any given point on the chart. The moving-average lines are also hard to see.

EASY TO USE The manual is quite clear, though, and with few exceptions, you should have no problem setting up, retrieving the data, and running the various charts and indicators needed for analysis. System commands are clear. However, the oscillator charts are a bit confusing.

Because the *Market Analyzer* ties in with the Dow Jones News/Retrieval, you can also access other data that might help you analyze stocks, such as (1) general, business, and economic news and (2) financial and investment services, such as corporate earnings, disclosure II filings, detailed financial data on companies and industries, weekly forecasts of money supply and other economic indicators, rankings and financial data of companies in the Fortune 500, highlights from Merrill Lynch Pierce Fenner & Smith's research division, and an on-line listing of over 15,000 corporate stock and bond issues, Treasury issues, foreign bonds, stock options, and mutual funds. In addition, the service even offers various services such as electronic mail and shopping.

The *Dow Jones Market Analyzer* is easy to use and offers many classic technical analysis techniques and indicators. However, it lacks many of the latest popular indicators and is limited in the amount of technical data it provides, which handicaps the package. So you should carefully examine your trading objectives as well as what the program offers to make sure *Market Analyzer* will suit your needs.

—Ronald F. Paino

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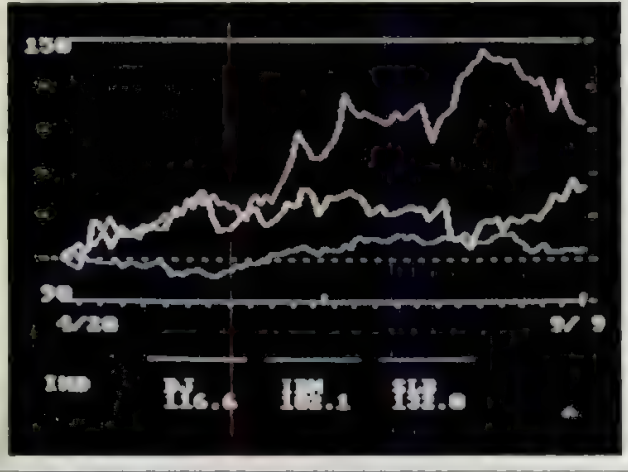
Dow Jones Market Analyzer

Dow Jones Software
P.O. Box 300; Princeton, NJ 08540; (800) 257-5114; (609) 452-1511 (in N.J.)

List Price: $349 **Requires:** 128K RAM, one double-sided disk drive, color/graphics card, modem, asynchronous communications adapter, DOS

In Short: An easy-to-use package, it offers some of the classic technical indicators but lacks the latest popular ones.

CIRCLE 654 ON READER SERVICE CARD



Shown here is a chart comparing price trends for three stocks. Charts are difficult to read because the x and y axes are not adequately labeled.

DOW JONES MARKET ANALYZER PLUS



Seasoned technicians familiar with the *Dow Jones Market Analyzer* (reviewed in this issue) have probably been waiting with bated breath for the long-awaited update, *Dow Jones Market Analyzer PLUS*. The two packages are sold separately; however, for $195 owners of the older package can upgrade to *Market Analyzer PLUS*.

Market Analyzer PLUS offers many more features than the older package; it allows you to program your own indicators and offers split-screen graphics. Although its primary purpose is technical analysis, *Market Analyzer PLUS* also throws in portfolio management features that allow you to enter portfolio data and generate standard reports such as profit and loss, current status, and short- and long-term gains for tax purposes. Yet, for a new package, *Market Analyzer PLUS* is still surprisingly limited. Like its predecessor, *Market Analyzer PLUS* offers only a limited number of the basic technical analysis functions. In addition, it allows you to access and analyze only the various Dow Jones averages.

As with the older product, *Market Analyzer PLUS* lets you update your price data manually or automatically, using the Dow Jones News/Retrieval service. You can obtain data on individual stocks, bonds, Treasury issues, mutual funds, and options through DJN/R. Editing the data is easy. (But you ought to have a hard disk if you want to maintain an extensive database.)

LIMITED PREPROGRAMMED INDICATORS *Market Analyzer PLUS*'s preprogrammed indicators are limited in number and most of them deal with volume. Preprogrammed functions include moving averages, trading bands, volume oscillators, support and resistance lines, relative strength, trend lines and parallel lines, ⅓–⅔ speed resistance lines, and least-squares fit lines.

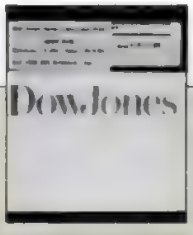
The package does allow you to add user-defined formulas not included in the list of preprogrammed indicators, such as price indicators, which include relative strength, stochastics, and rate of change. You can also design your own proprietary studies. To do this, you use the program's "keystroke buffer replay" feature to save the series of keystrokes comprising your formula. You can then activate your formula by pressing a single key. But why this extra step? All the basic studies could have been preprogrammed as they are in most other packages.

In addition to the familiar indicators that *Market Analyzer PLUS* offers, the package has created some studies of its own. The ability to create your own group indexes instantly appealed to me. But the method that *Market Analyzer PLUS* uses to calculate its indexes differs from that used by the standard of the industry, Standard & Poor's 500 Index. Thus, you can't expect the same results. Since a technician rarely uses indicators that haven't been extensively tested to prove their worth, I asked a company representative if the company had evaluated the effectiveness of this new way of formulating group indexes. It had not.

Because you can't get New York Stock Exchange data from the Dow Jones News/Retrieval service, you cannot plot standard indicators dealing with advance-decline lines or lines for new highs minus new lows. However, you can create your own group advance-decline lines. Since the concept of making new group advance-decline lines is not generally embraced by technicians, I asked if any research had been done to evaluate the validity of this approach. Again the answer was no.

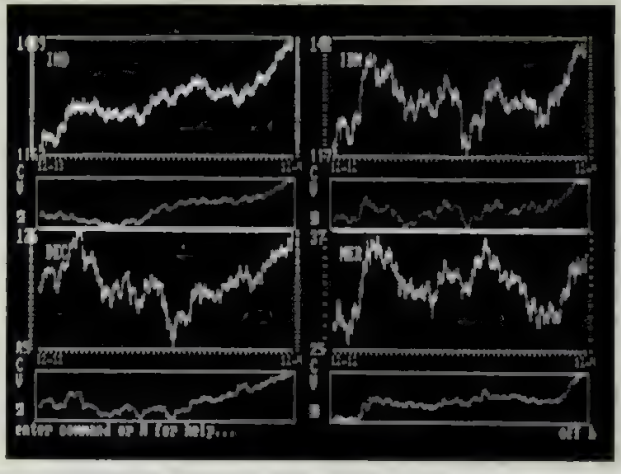
NICE TRY, BUT The charting features of this package incorporate some nice ideas, but in many cases these ideas could have been executed more professionally. For example, in the high-resolution mode, *Market Analyzer PLUS* allows you to divide the screen into two or four sections. In addition you can divide each quadrant into two sections for a total of eight sections on the screen. This quadrant screen lets you easily compare different charts and studies. However, in the eight-section mode, the top half of each quadrant must be a high-low-close bar chart. Thus, if you want to look at different studies for the same market index or stock, you'd see four identical bar charts in the upper half of

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Dow Jones Market Analyzer PLUS
Dow Jones Software
P.O. Box 300; Princeton, NJ 08540; (800) 257-5114
List Price: $449 **Requires:** 256K RAM, two double-sided disk drives, DOS 2.0 or later; color/graphics card recommended.
In Short: This update of the familiar *Market Analyzer* package does offer more features than its predecessor but is still limited and relatively cumbersome to operate.

CIRCLE **667** ON READER SERVICE CARD



You can divide the screen into four quadrants that show different studies or stocks.

each quadrant and four different studies in the lower part. It would have been more useful if each quadrant could have contained two studies, thus enabling the screen to display one bar chart and seven studies. In medium-resolution mode, you can't use a split screen.

In the split-screen mode, you can superimpose a study over a price chart. This is a nice idea, except that the study first must be moved up to the price chart in a dot format. Then you must connect the dots by creating a 1-day moving average of the study in order to read it, a cumbersome procedure.

When you plot a point and figure chart, the package automatically marks off each month, which is very helpful in establishing a time reference. This feature is confusing, however, because the package plots the month's last digit only. Thus, January and November are both 1 and February and December are both 2.

Another interesting idea is the extend feature, which automatically extends the chart 10 days into the future, allowing you to manually enter hypothetical values in order to determine the price at which a moving average or trend might be violated. *Market Analyzer PLUS* also includes an autorun feature that saves the series of commands for displaying indicators or charts for any or all items in your portfolio. The view summary and view trend are features that enhance your analytical stock-screening capabilities.

Market Analyzer PLUS allows you to use only the Dow Jones averages for charting and for relative-strength analysis—not the Standard & Poor's 500 Index, the industry's standard.

SKIMPY SCALING As for the charts themselves, the scaling on both the price and indicator charts is inadequate; not enough points on the *x*-*y* axes are listed, forcing you to approximate the date and price coordinates of a point. Interestingly, you can write notes and place arrows on the charts and studies in the text mode.

The documentation, which is 235 pages, is unnecessarily cumbersome and overwhelming. You'll have to devote a considerable amount of time, maybe as long as 2 weeks, to becoming proficient with the software. Product support, however, is quite professional.

As a technical analyst, I have a hard time recommending this package since its basic analysis features are so limited. You buy a computer program to let the computer do the work; this package requires you to enter too many equations yourself and is unnecessarily complicated to operate.

—Ronald F. Daino

GANNTRADER I



Ganntrader I from Gannsoft Publishing Co. is a distinctive program designed exclusively for the serious student and the experienced user of the trading methods of W.D. Gann. It does an excellent job of applying Gann's trading methods and is an extremely valuable tool for the dedicated Gann analyst. Plus it offers the nicest price-only bar charts you'll find anywhere.

GANN'S METHODOLOGY W.D. Gann, an influential technician of the first half of this century, developed and taught some rather unique ways of viewing the markets, both commodities and equities. Although his theories are more popular among commodity traders than stock traders, Gann himself charted, wrote about, and actively traded in both markets. His methods are different from most of those currently in vogue, and they can also be confusing and difficult, particularly for the beginner—probably anyone who hasn't spent several years in intensive study of Gann's work. On the other hand, *Ganntrader I* is easy to use and is a unique way to learn, test, and apply Gann's trading methods.

The version of *Ganntrader I* that we tested is designed for use with the Commodity Systems Inc. (CSI) data format. Another version is available for use with *Compu Trac* format data. *Ganntrader I* can convert daily prices into weekly ranges, but you'll need the data service's software to manipulate other data.

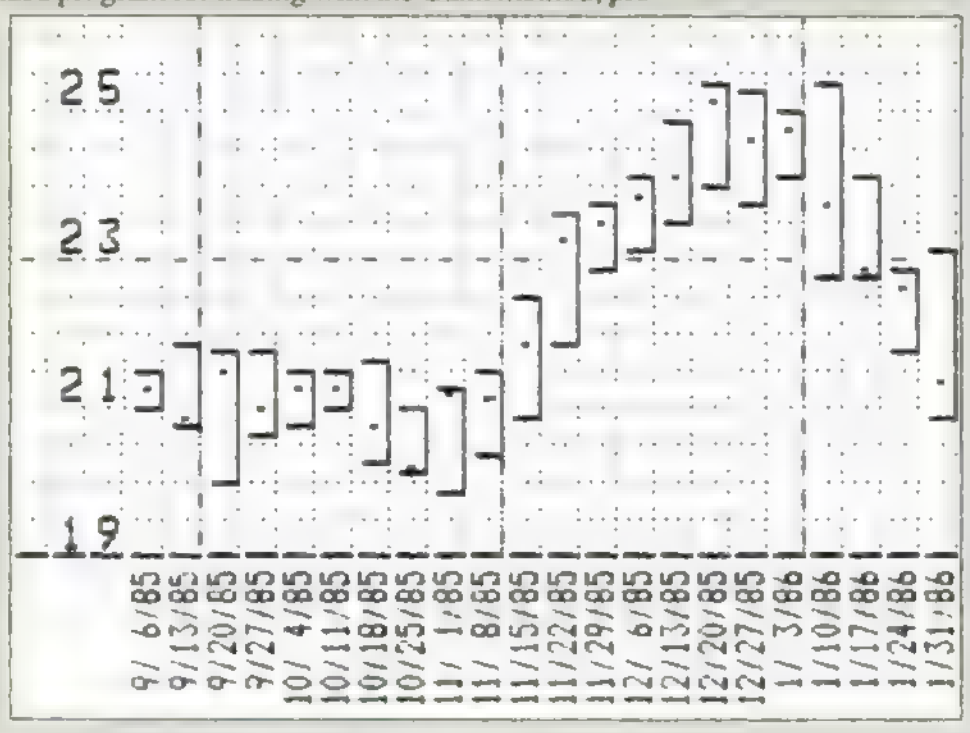
BIG, BEAUTIFUL CHARTS In addition to facilitating an education in Gann trading methods, the program has another winning feature: It prints big, beautiful, flexible, arithmetic high-low-close bar charts.

PC FACT FILE



***Ganntrader I*, Version 1.10**
Gannsoft Publishing Co., Peter A. Rich
311 Benton St.; Leavenworth, WA 98826; (509) 548-5990
List Price: $549 **Requires:** 192K RAM, two double-sided disk drives, DOS 2.0 or later, modem and printer recommended.
In Short: A highly specialized program for trading with the Gann method; produces big, beautiful charts

CIRCLE **681** ON READER SERVICE CARD



This detail from a large Ganntrader I *chart shows that the package prints grids, which makes charts easy to read.*

Ganntrader I can produce daily charts in a 5- or 7-day-a-week format as well as in the standard Gann format of trading days only, excluding weekends and holidays. You can select up to 300 days, weeks, or months and can also specify the price scale in various ways. Gann angles, squares, eighths, and thirds are available.

Of particular use to the Gann analyst, these types of charts are not available from the big commercial chart services. In fact, the charts *Ganntrader I* produces are the best we've seen from any software package. Since the program has no screen graphics, you'll need a good dot matrix printer to produce them.

AN UNCOMMON PROGRAM Gann was fascinated with all kinds of numbers, so much so that he also investigated numerology and astrology. As a result, *Ganntrader I* offers you the ability to calculate the square of 9 (octagon) and hexagon charts and to plot prices with planetary signs, conjunctions, and aspects. If you like to explore all the possible influences on the securities market, you can experiment with these calculations and plots as indications of potential support, resistance, and trend changes.

On the other hand, the program doesn't offer the most common technical studies like moving averages, rates of change, ordinary trend lines, and volume displays. And, as mentioned, it has no screen graphics. Also lacking are an autorun feature and a profitability-testing routine.

DOCUMENTATION *Ganntrader I*'s 32-page user manual is clearly written and facilitates the program's use, with one notable exception: A beginner could erase the DOS 2.0 disk in drive A: by using the FORMAT/S command as instructed. (The command should be FORMAT B:/S.) In addition, the manual displays 19 separate sample charts along with the text.

The *Ganntrader I* manual is not intended, however, to teach you Gann's methods; you'll have to read books or take courses to learn more about them.

IN A CLASS BY ITSELF *Ganntrader I* is like no other product on the market. It's valuable for students and users of the unique methods of W.D. Gann. Although a highly specialized, limited-use program, *Ganntrader I* serves its users well. It also enables you to print the most attractive large (13 by 38 inches) bar charts that we've seen. Even if you're not an aficionado of W.D. Gann, you may want to use *Ganntrader I* just for the super charts you can produce with it.—**Robert W. Colby**

HIGH-TECH



High-Tech from MicroVest is a screen graphics charting program. It's designed to do daily tracking of trading systems like those developed with *The Profit Optimizer*, a complementary program from the same vendor (reviewed in this issue). But you don't need *The Profit Optimizer* to run *High-Tech*, the main function of which is to construct on-screen charts of prices and technical indicators. *High-Tech* also offers graphics for interpreting chart patterns.

High-Tech shows you up to four charts on a screen, and it can plot high-low-close bar charts, volume histograms, moving averages, trend lines, trading bands, oscillators, support and resistance lines, relative strength, retracements, up/down patterns, spreads, and regression fit. With *High-Tech*, you can produce a good variety of technical market indicators: Williams's percent R, on-balance volume, swing index, variable oscillator, ratios, Accumulation/Distribution, volatility, regression slope, moving-average momentum, Alexander's filter, directional movement, commodity channel index, high/low oscillator, parabolic, momentum, moving-average oscillator, Alexander's variable, and momentum crossover.

HIGH-RESOLUTION SCREEN The overall quality of the screen displays is good. *High-Tech* uses the high-resolution graphics mode, and the text labels it produces are readable. The time scale is labeled with the month and the week. In addition to monochrome, the program produces graphs in three colors and can display them in medium but not high resolution. You can produce hard copy of all the graphs.

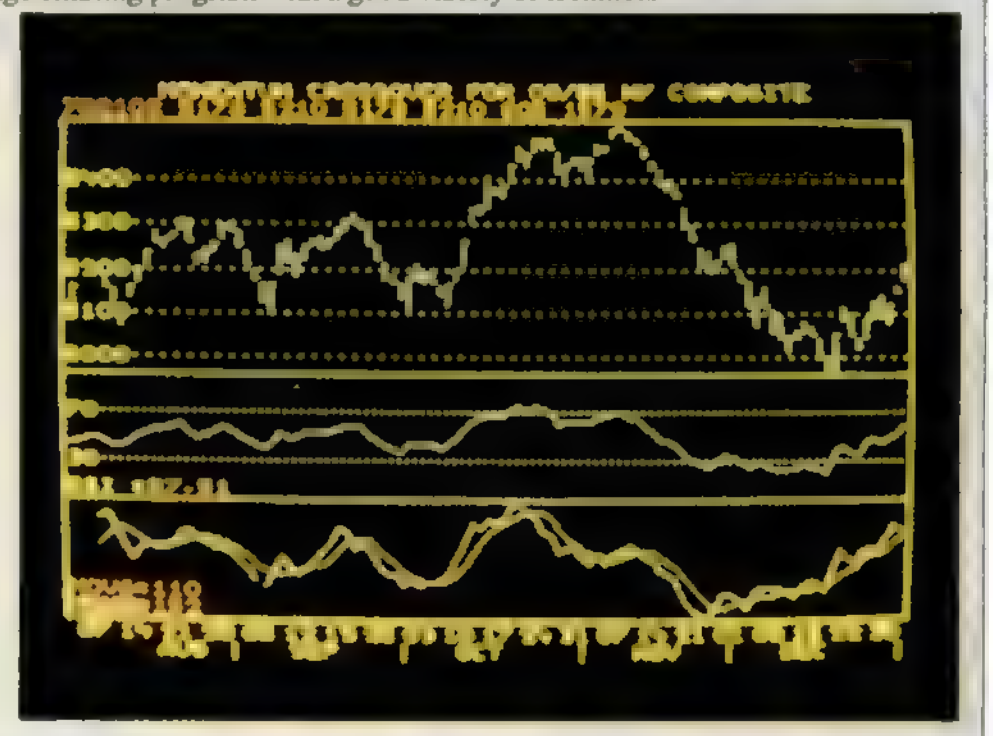
One limitation is that you cannot rescale or zoom in or out of a graph. Also, to

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High-Tech
MicroVest
P O Box 272; Macomb, IL 61455; (309) 837-4512
List Price: $495 **Requires:** 256K RAM, two disk drives, color card, DOS 2.0 or later.
In Short: An above-average charting program with a good variety of technical indicators; it can be used with *Profit Optimizer*.

CIRCLE 684 ON READER SERVICE CARD





High Tech's *plotting features include Wilder's RSI and oscillators.*

display data earlier than that being currently displayed requires loading from the data file and recalculating. Another minor problem occurs when using weekly or monthly data—the time labels overwrite each other, making them impossible to read.

EDITING DATA To construct on-screen charts of prices and technical indicators, *High-Tech* reads the popular Commodity Systems Inc (CSI) format for price data. A Data Manager module included in the program includes a set of functions for manually updating price files. Anyone who doesn't subscribe to an on-line data retrieval service such as CSI or Nite Line will find this feature useful. Data Manager also allows you to create and delete price files as well as add, delete, and edit specific days in a price file.

High-Tech has an autorun feature—a real time saver if you tend to construct and print the same charts regularly. You can initiate the charting module in either manual or autorun mode from the main menu. If you select autorun, *High-Tech* will request the name of an autorun file to use. You can set up several different autorun files (simply sequences of keystrokes), creating one for daily charts and one for weekly charts, for example.

To create an autorun file, *High-Tech* will capture the keystrokes used to create the desired sequence of charts. If you add or delete any price data files (as you do frequently with commodity data when contracts expire and new ones are initiated), you must re-create the autorun file from scratch because the autorun feature offers no editing capability. Keyboard enhancement programs like *SuperKey* or *ProKey*, which could totally replace *High-Tech*'s autorun feature, may therefore prove more suitable.

OPERATION When you invoke the charting function, the program displays a list of the price data files located on the prespecified drive. Once you've selected the desired price file, *High-Tech* presents the Technical Indicator menu, which lists the 38 available plots and indicators.

After you select one of the plots or indicators, *High-Tech* asks you where the chart is to be placed on-screen. The program provides a number of predefined window configurations in which it can place charts, as many as four on a screen. You can construct a screen, for example, showing a bar chart in the top half and two different oscillators in each of two quarter-sized windows below it. The program can change any window on the screen without redrawing the others.

From the chart display, you can go to the Tools menu, which gives you a number of functions to choose from, such as activating the cursor keys for reading data points and drawing lines, for saving and loading screen images, and for reading new data files and earlier data from the current file. You can also initiate a screen dump of the current display; although the manual doesn't mention it, you must have first loaded the DOS GRAPHICS.COM program.

DOCUMENTATION With a few minor exceptions, the documentation for *High-Tech* is good. The manual describes all features well and includes examples of all menus and input screens.

The descriptions of each of the technical indicators are particularly complete and useful, giving the typical use for each indicator, the parameter options, the formula for calculating each indicator, and a reference source for further information. Finally, the manual shows a screen display for each indicator. This section of the documentation is a valuable educational tool for new technical analysts.

ABOVE AVERAGE *High-Tech* is an above-average charting program. Its strengths are the variety of technical indicators it charts and the extensive, informative documentation of each indicator. Combined with *The Profit Optimizer* or as a standalone program, it can help you chart your trading strategies.—**Alan R. Shaw**

MARKET COUNSELOR



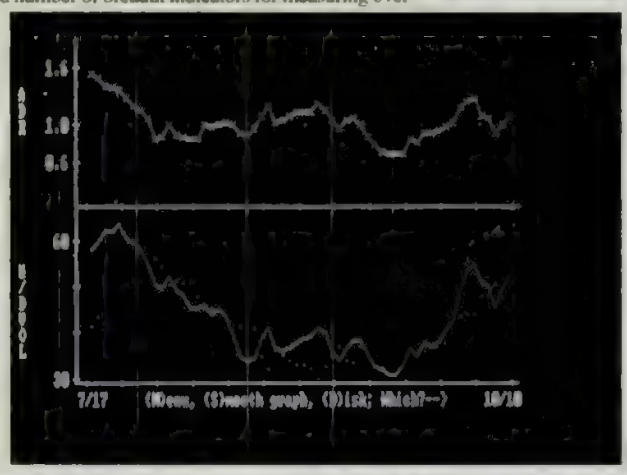
The marketing literature for *Market Counselor* claims that it provides buy and sell signals for the general market. The package, however, is limited and

PC FACT FILE



Market Counselor
Hanahan and Judson Ltd.
2888 Bluff St., Boulder, CO 80301; (303) 449-8896
List Price: $189 **Requires:** 128K RAM, one double-sided disk drive, color graphics card, DOS 2.0 or later.
In Short: It offers a limited number of breadth indicators for measuring overbought/oversold conditions on the general market and is difficult to use.

CIRCLE 695 ON READER SERVICE CARD



Market Counselor *lets you display only two indicators at a time for a maximum of 60 days.*

oversimplistic. *Market Counselor* is also difficult to use.

To give you buy and sell signals, the package relies on 10-day overbought/oversold oscillators. While these are time-honored technical analysis tools, technicians normally use them in combination with a variety of other studies. The designers of the package are naive in their assumption that these tools alone will adequately predict the direction of the market. And, in fact, when I tried to use this package, I found many situations where I was left hanging with no clue as to whether I should buy or sell the market index.

For example, the sales literature points with pride to the "correct" buy signal of May 28, 1982. However, it doesn't say what you should have done between then and August 12, 1982, when the broad-based New York Stock Exchange Composite Index fell another 8.8 percent to a new 2-year low. I suspect that most traders wouldn't have been able to stand that kind of strain.

The program also offers simple 10-day moving averages of breadth data, Wilder's 14-day Relative Strength Index, and specialists' and odd-lot short sales data—that's all. There is nothing new.

TEDIOUS DATA ENTRY The package does not access an on-line database. Instead, you must manually enter 11 different pieces of daily stock market data, including date, Dow Jones close, total NYSE volume, volume of advancing stocks, volume of declining stocks, advances, declines, odd-lot, and specialists' short sales ratios. You can find this data in most daily newspapers and, of course, *The Wall Street Journal*.

I had no trouble updating a file, but I wasn't able to edit that data because the program couldn't find it. The manual offered little help. It simply advises you to enter data accurately in the first place and keep good, current backup data disks. When all else fails, it instructs you to write the vendor and ask for a backup. I found this inability to edit files unacceptable.

From this data, the program can plot 13 graphs, but the package only describes how you would use 8 of them. The remaining 5 graphs are neither described in the manual nor are popular indicators. For example, you can plot the advance/decline ratio, a well-known study that is described in the manual. But you can also plot the number of stocks that advanced each day. The latter is neither described in the manual nor is it a widely known indicator.

UNSOPHISTICATED GRAPHICS The monochrome graphics are relatively unsophisticated: You can display only two indicators at a time for a period of 60 trading days—that's all. Most packages let you plot more than three times as many periods. You may add simple moving averages up to 50 days. The product will not let you perform moving averages for any longer time period. For example, you cannot do the 200-day moving average that analysts commonly use. In addition, the program lacks such basic indicators as trend lines and trading bands. The package does include a limited autorun feature.

The manual contains an 87-page discussion with examples showing how to interpret and use the eight main indicators. However, the manual's explanation doesn't go quite far enough. On a number of occasions, it resorts to vague language like "may," "might," and "frequently." Concluding a discussion of contratrend corrections, for example, the manual says, "It seems there is no substitute for good judgment." However, if you already have good market judgment, you wouldn't need simplistic trading rules to tell you when to buy or sell.

In sum, *Market Counselor* is a very limited program for general market timing. Data must be entered manually, and data editing is a problem. Graphics capabilities are extremely limited. The program could use some revision and seems relatively unattractive as it currently stands.—**Robert W. Colby**

★ EDITOR'S CHOICE

METASTOCK



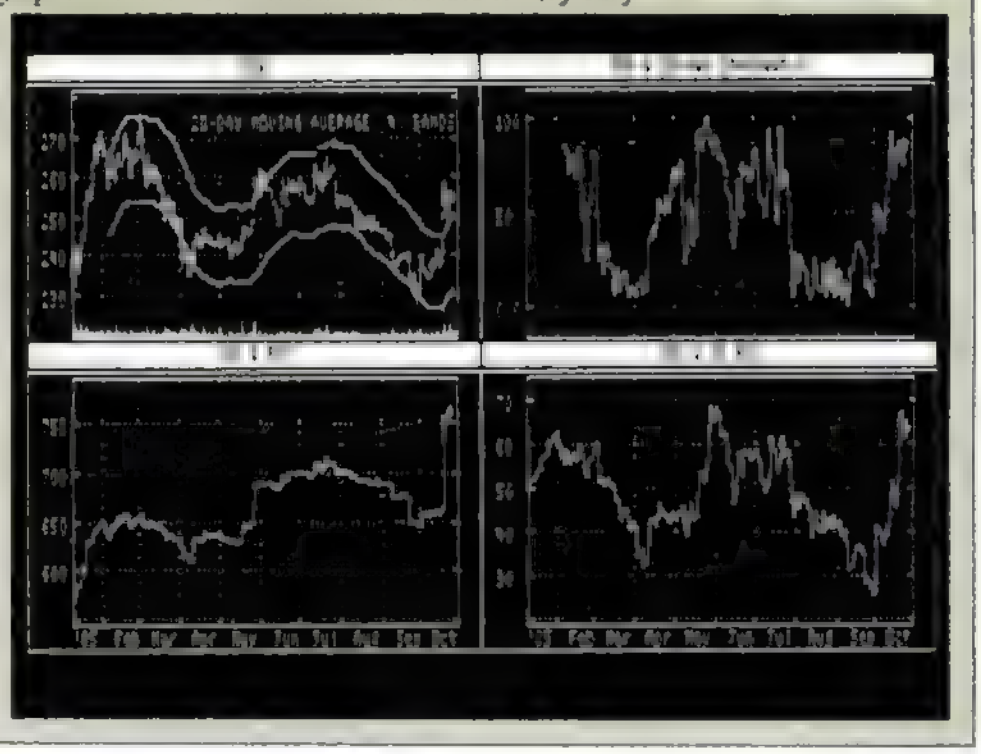
A new entry in the technical analysis software market, Computer Asset Management's *MetaStock* has parlayed the strengths and weaknesses of its predecessors into something better, faster, and, at only $195, less expensive. *MetaStock* lets you analyze individual securities.

PC MAGAZINE FACT FILE

MetaStock
Computer Asset Management
P.O. Box 26743; Salt Lake City, UT 84126; (800) 882-3040 (801) 964-0391
List Price: $195 **Requires:** 256K RAM, two double-sided disk drives, color graphics card, DOS 2.0 or later.
In Short: Offers superior graphics and a well-written manual and is very easy to use.

CIRCLE **686** ON READER SERVICE CARD





Though only 4 are shown here, MetaStock *can show up to 36 different charts on the screen at the same time.*

Computer Asset Management also sells an unrelated package, *The Technician*, for general market analysis (also reviewed in this issue).

The menu-driven *MetaStock's* most impressive features are superior, flexible graphics; a well-written 155-page manual with a tutorial, illustrations, an index, and explanations of technical analysis concepts and terms; and overall ease of use. Flexibility of data sources is another strong feature. The program can access seven on-line databases that use the Compu Trac data format: Commodity Systems Inc., Interactive Data Corp., CompuServe, Remote Computing, Security Data Access, I.P. Sharp Associates, and National Computer Network. In addition, it can read data disks from the Dow Jones News/Retrieval service.

MetaStock charts and manipulates data on individual stocks, commodities, general stock market price indexes, bonds, mutual funds, and options. It can also handle other types of data if you enter it by hand in a standard Compu Trac format. The sample data disk included with the package includes 9 months' histories on four stocks and five indexes, including the Dow Jones 20-bond average. Any Compu Trac-format data disks work equally well.

WINDOWED GRAPHICS *MetaStock's* high-resolution graphics feature multiple windowing; it can show up to 36 different charts on the screen at the same time, including different indicators and stocks, commodities, or options. You can also show both a stock price and an indicator chart in each of the 36 windows, making a total of 72 charts on the screen. Then you can zoom back again to the 36 stock price charts. *MetaStock* can even display data from different data disks at the same time. You just call up a chart from one disk, take it out of the drive, put the next disk in the drive, and repeat the procedure. You can move the charts around and change their size from about 1 inch to full screen. *MetaStock* displays up to 1,000 days, weeks, or months of data. Automatic scaling is good, but you can also manipulate scales to suit your taste. Horizontal and vertical grid lines are optional.

MetaStock has most of the popular charting tools, such as moving averages (simple, exponential, and weighted), trading bands, trend lines, parallel channels, linear-regression lines, cycle-interval lines, and horizontal and vertical lines. You can place arrows and write labels at key points on the chart. If you have a color monitor (which is not required to run the program, although a color graphics card is), you can choose 1 out of a total of 15 colors. You can extend the chart up to 1,000 periods beyond the latest data point for hand updating and for extending trend lines forward in time.

PRESET INDICATORS *MetaStock* currently includes 13 preset indicators and oscillators, including difference of two moving averages, positive and negative volume, on-balance volume, price or volume rate of change, stochastic oscillators, volume accumulation/distribution, Wilder's Relative Strength Index, and relative-performance ratios. More indicators are planned for future updates, but these should suffice for most users.

MetaStock is an excellent and attractively priced program. Novices both in computer use and in technical analysis should have little trouble getting started if they read the well-written manual, which includes explanations of technical analysis concepts—their biggest challenge will probably be selecting and learning to use an on-line database. Experienced users will find *MetaStock* fast and easy to use and will like the graphics.

—Robert W. Colby

N² MARKET ANALYZER-XL



Unlike most technical analysis packages, which include preprogrammed indicators, *N² Market Analyzer-XL* lets you develop your own indicators by performing calculations on price data. Although you could use *Market Analyzer* to analyze the performance of individual stocks, it is geared toward analyzing the market—the Standard & Poor's 500 Index, the Dow Jones industrial average, and other market indexes.

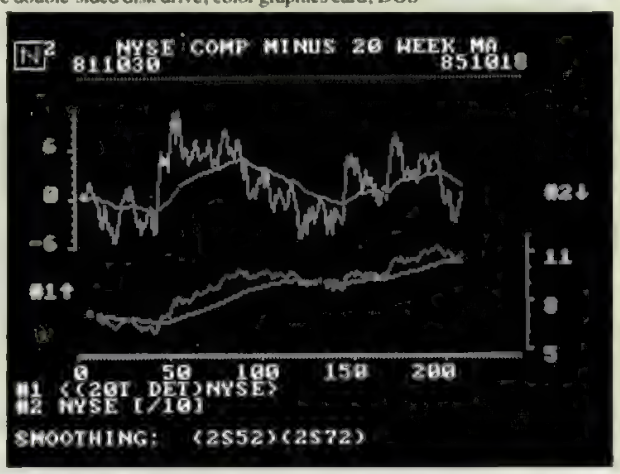
When analyzing a stock, however, *Market Analyzer*'s sibling package, *N²*

PC MAGAZINE FACT FILE

N² Market Analyzer-XL

N² Computing
5318 Forest Ridge Rd.; Silverton, OR 97381; (503) 873-5906
List Price: $395; $595 for both *N² Stock & Futures Analyzer-XL* and *Market Analyzer-XL*
Requires: 256K RAM, one double-sided disk drive, color graphics card, DOS 2.0 or later.
In Short: Offers flexibility to create your own indicators for general market data but is relatively cumbersome, slow, and difficult to use.

CIRCLE 690 ON READER SERVICE CARD



Each time you use or plot an indicator, you must key in an equation for it.

Stock & Futures Analyzer-XL (reviewed in this issue), is the better package for examining volume and high, low, and closing prices.

Market Analyzer comes with a disk of general market information dating back to September 1980. This data can be updated manually using published sources, such as *The Wall Street Journal, Barron's*, and so forth. In addition, if you purchase N^2's optional $45 *INTERFACE* program, you can access on-line databases, including the Dow Jones News/Retrieval, CompuServe, Warner Computer Systems, and Commodity Systems Inc. (CSI). *Market Analyzer* can also read and plot the *Stock & Futures Analyzer*'s data disks, but the converse is not true, and it can read CSI and Dow Jones format disks. In order to access the on-line databases, you must follow the database vendor's documentation.

OPERATING ON DATA After you load the data into memory, you can either plot or "operate" on it. The latter leads to a complex menu, offering many possible combinations of addition, subtraction, multiplication, division, powers, smooths, momentums, and so forth. Many keystrokes later, you can then plot all these simple or complex data manipulations.

The program allows you to plot one or two files, each containing price data for a different stock or market index, for a choice of 40, 80, 120, 240, or 480 days or weeks; in other words, you can chart weekly price history for a maximum of 9.23 years. Of course, the charting is also limited by the amount of data available from your data source.

The program easily plots the basics such as moving averages of any time period you specify, trading bands, trend lines, and speed resistance lines. However, if you want to create and plot any other indicator—even a basic trader's tool like oscillators—*Market Analyzer* forces you to key in an equation for that indicator every time you use it. You may wish to consider one of the several outside autorun programs, which sell for about $50, that basically let you create macros to automate some of these tedious keystrokes. N^2 Computing also offers *Superkey* at a 10 percent discount.

The medium-resolution (320 by 200) color and the new high-resolution graphics are no better than average for this type of package.

The charting has a few problems. *Market Analyzer* does not permit you to change the scale of the dates on the *x* axis or prices on the *y* axis. The program also lacks a zoom feature for close-up chart inspection. For example, when you look at a chart to determine at what date and price two moving-average lines crossed each other, you'll have difficulty seeing the coordinates of a given point. Fortunately, the cursor readout feature solves this problem; you put your cursor on a point, hit R, and the program will tell you its price and the date of the crossing.

WEAK ESC KEY A final weakness of the package is that its Esc key will not always back you out of a mistaken keystroke. Often you're forced to continue through a series of keystrokes before you can get out.

The 46-page user manual is relatively clear and well written. However, I'd like to see explanations of indicators, charts, and a description of how to get onto the various databases that the program accesses. Moreover, it doesn't contain an index. Telephone support is available, however, and the helpful vendor encourages you to call him 7 days a week.

Because *Market Analyzer* allows you to create your own indicators, it offers great flexibility and power. However, the package is also relatively cumbersome, slow, and awkward to use. *Market Analyzer* seems best-suited to the seasoned technician with some previous computer experience. Beginners, however, may be happier with a simpler-to-use, easier-to-learn program.—**Robert W. Colby**

N^2 STOCK & FUTURES ANALYZER-XL



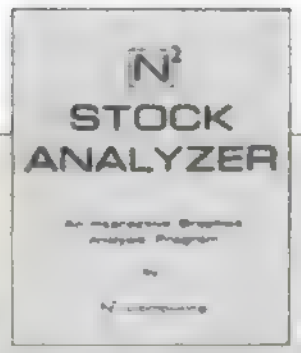
N^2 Stock & Futures Analyzer-XL is designed primarily for plotting and analyzing individual stock and commodity data. It even plots some general market data.

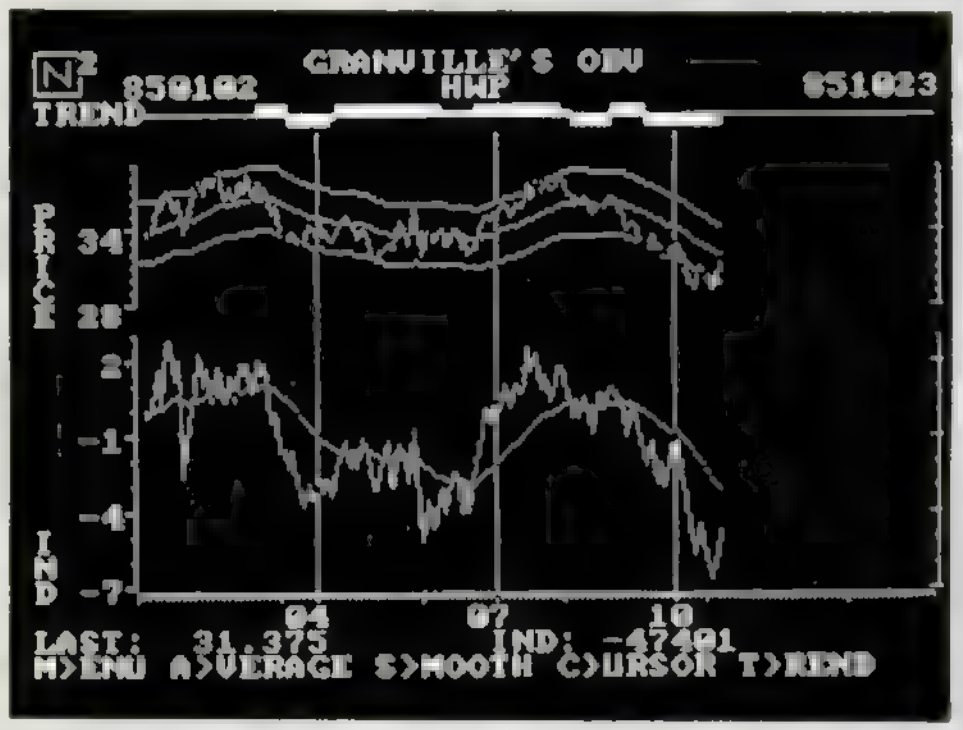
Stock & Futures Analyzer looks and

PC MAGAZINE FACT FILE

N^2 Stock & Futures Analyzer-XL
N^2 Computing
5318 Forest Ridge Rd.; Silverton, OR 97381; (503) 873-5906
List Price: $395, $595 for both *Stock & Futures Analyzer* and *Market Analyzer*
Requires: 256K RAM, one double-sided disk drive, color graphics card, DOS 2.0 or later.
In Short: It offers great flexibility to create your own indicators and also includes preprogrammed indicators. This is not a package for novices who want ease of learning and use.

CIRCLE 691 ON READER SERVICE CARD





To figure out the coordinates of a point on the chart, you must use the cursor readout feature.

acts like its sister program, *N² Market Analyzer-XL* (reviewed in this issue), but it has more features. Like its sibling, *Stock & Futures Analyzer* helps you create indicators; unlike its sibling, it includes a number of preprogrammed indicators and stores up to 20 indicators on-disk, saving you from entering equations for indicators every time you use them.

Stock & Futures Analyzer has a treelike menu structure. Each of the program functions, growing out of the main program selection menu, is distinct and does not share data. If you select the Plot Stocks option, you would then load your data. *Stock & Futures Analyzer* reads CSI, Dow Jones, RTR, CompuServe, and Warner data disks and accesses their on-line databases. Then you can choose a submenu option to quickly view a stock's daily price data on a standard high-low-close bar chart at the top of the screen. On the bottom half of the screen, *Stock & Futures Analyzer* plots on-balance volume (OBV), a running total of net trading volume, as a default indicator. You can change the default setting so that 1 of 20 other indicators will appear. If the data service you subscribe to permits, *Stock & Futures Analyzer* can plot periods of 70, 140, 280, or 560 days or weeks.

PREPROGRAMMED INDICATORS The program comes with the following preprogrammed indicators: Bostian's Intraday Intensity Index, Williams's Accumulation-Distribution Index using the close-open differential/range times volume, 10-day momentum, a modified Wilder's Relative Strength Index, 6/36 period exponential-smooth differential, and midpoint OBV. In addition, you can erase and change any existing indicator and install up to 14 others through the Create Indicators menu. To invent and analyze a new indicator, you use the add, subtract, multiply, divide, *x*-period moving average, and rate-of-change commands on the Create Indicators menu. However, the *Stock & Futures Analyzer* manipulates data for only one stock at a time. Thus, the package cannot do relative performance ratios, which measure how a stock is doing relative to an average of stocks on the broader market—odd for a stock program.

Another main menu choice is the Point and Figure Chart option. Unlike other stock charts that plot price versus time, a point and figure chart is a one-dimensional graph of the price fluctuations for a particular stock. Even if you have already loaded the necessary data into the *Stock & Futures Analyzer*'s Plot Stocks option, you must reload your data. You then specify the "box size" (a value for the squares on the grid, with each square representing a stock price increment; for example, .5 points, or 50 cents, is the minimum price increment *Stock & Futures Analyzer* will chart). Next, you can specify a "reversal" size to filter out insignificant price fluctuations from the chart. The reversal size is the number of vertical units the price has to move before you're allowed to record a change in price direction. For example, *Stock & Futures Analyzer*'s default reversal is three, so if price is in an uptrend, you have at least three squares down before you can record a downturn in the stock price, and vice versa. You can change *Stock & Futures Analyzer*'s default to another whole number.

Stock & Futures Analyzer is relatively slow and tedious to use. Even if you use an indicator that is already programmed into the system, it can take 45 to 90 seconds for you to select a stock, load the data file into memory, and plot it on the screen.

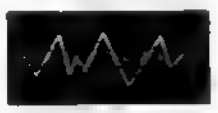
NOT-SO-GREAT CHARTS *Stock & Futures Analyzer* offers medium-resolution, 320 by 200 color and high-resolution, monochrome graphics. Like *Market Analyzer*'s charts, *Stock & Futures Analyzer*'s charts leave room for improvement. It is difficult to figure out the coordinates of a point on the chart; instead, you must use the cursor readout feature, which identifies specific dates, prices, and indicator levels of the spot at which the cursor is placed. In addition, it would be useful if you could adjust the scale of the vertical price axis. Finally, there is no zoom feature to enable you to examine charts in greater detail.

Stock & Futures Analyzer also doesn't let you hit the Esc key to recover from a mistaken keystroke. Instead, you must complete the series of keystrokes you've started and then escape.

Stock & Futures Analyzer's 44-page user's manual is relatively clear and well written, though it lacks an index. Telephone support, however, is excellent.

Stock & Futures Analyzer offers great flexibility at the cost of complexity, slowness, and clumsiness. The patient and experienced, detail-oriented technical analyst may find this program more suitable than the beginner; it is not a program for someone who wants ease of learning and use.—**Robert W. Colby**

ONE MINUTE MARKET ANALYST



One Minute Market Analyst, a Personal Equity Management System (PEMS) from Personal Equity Computing, could be an interesting and helpful technical analysis package, especially since it was recently reduced sharply in price from $495 to $195. But like a number of other technical packages reviewed in this issue, *One Minute Market Analyst* gets low marks where they count most—in its charting capabilities.

MARKET FOCUS According to the easy-to-read manual, the basic tenet of *One Minute Market Analyst* is "to look at the markets first and individual stocks second." If you're interested in individual stock analysis, you won't find it in *One Minute Market Analyst*.

One Minute Market Analyst can help you follow a good selection of stock market indicators on a daily and a weekly basis. A few select ratios that would even catch the eye of a technical specialist pop up in the program. For example, *One Minute Market Analyst* offers a gold/silver ratio, a call/put ratio, and an advance/decline ratio in the daily data. The weekly version includes New York Stock Exchange members/specialists calculations, along with the "Bull-Bear" numbers of the investment advisors.

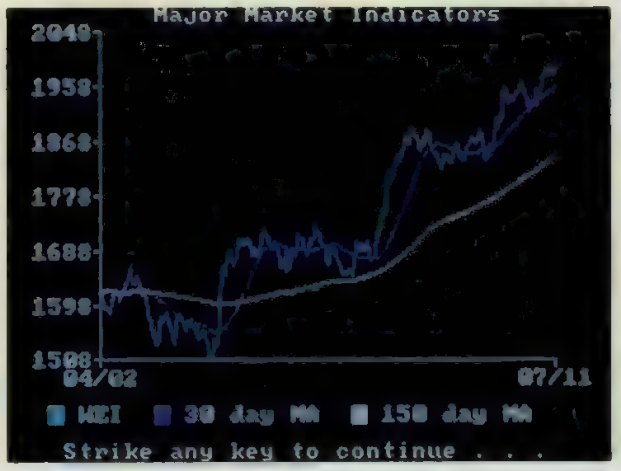
Personal Equity Computing calls other daily statistics—including all major currencies and the Fed Funds closing bid, among others—fundamental input. Weekly fundamental plots that a technical analyst would also use include money supply, Treasury bill yields, and some "cash" ratios.

PC MAGAZINE FACT FILE



One Minute Market Analyst
Personal Equity Management System (PEMS)
Personal Equity Computing Inc.
P.O. Box 177; Glenford, NY 12433; (800) 431-6082; (914) 331-6663 (N.Y.)
List Price: $195 **Requires:** 128K RAM, two single-sided floppy disks, DOS 1.1 or later.
In Short: A limited technical analysis program that helps you follow a good selection of stock market indicators but has below-standard graphics capabilities for charting.

CIRCLE **647** ON READER SERVICE CARD



Charts from this package show only beginning and ending dates with no interim demarcations.

One Minute Market Analyst, like a number of other technical analysis programs reviewed here, has a "black-box" system to produce market bottom indications for stocks, along with market buy and sell signals. Personal Equity Computing intends the system to be objective; hence *One Minute Market Analyst* analyzes 36 types of data (some weighted) as input to set thresholds for the indications. Since the supplied sample data was for just a little more than a year, we could not evaluate the accuracy of the system, which on the surface looked quite interesting.

GRAPHICS *One Minute Market Analyst* fails when it comes to charting. The graphics are below standard, which is really too bad because the program has a lot of data to plot. Since you cannot define the scales, you're stuck with the program's imposed horizontal and vertical values. Some charts produced by *One Minute Market Analyst* were hard to define on the screen or when dumped to the printer.

The program uses three colors, including white, on the screen, but some three-level graphs were indistinguishable or turned out to be close to horizontal lines. In addition, the charts post only a beginning and an ending date, with no interim definitions, and the dates do not include the year, which makes for a potentially confusing system.

INSTALLATION AND DATA ENTRY Installing and using the program are easy. Once I got through to user support (apparently I caught the vendor during a change of headquarters), I obtained good assistance on starting up. The program is menu-driven and easy to use, requiring less than a day to learn.

One Minute Market Analyst accesses its own PEMS host data collection service, obtaining current and historical data (maximum 20-day retrievals). Accessing the PEMS computer to update data costs $60 per quarter. You can also update the files manually. That's the way the vendor updates its own database—using a daily newspaper as the source. On the plus side, the system supports a good number of daily, weekly, and monthly indicators.

The 220-page documentation includes a tutorial. It's clearly written, with good instructions for setting up and installing the program.

IN SUM The PEMS *One Minute Market Analyst* needs some improvement to boost it into the ranks of serious technical analysis software. Data updating went without a hitch through the PEMS host computer. However, using the program's limited graphics capability is especially frustrating. *One Minute Market Analyst* is better than some programs on the market, and the price has come down to a more realistic level, but the charting problems would seem to offset the assets.
—Alan R. Shaw

QUICKPLOT



If you'd like to experiment with some basic charting techniques for stock, index, or commodity and futures data but you don't want to invest heavily in charting software right away, then Commodity Systems Inc.'s (CSI) basic charting program *Quickplot* is for you. *Quickplot* is the charting part of CSI's *Quicktrieve* data retrieval and analysis system, which also includes *Quickmanager* to organize the data that *Quicktrieve* retrieves on your own disks and *Quickstudy* to help analyze it.

Quickplot is fast and relatively simple to use. The charts are basic, clear, and readable. CSI's data, available via modem, is good and reasonably priced. The program does a fine, although basic job. Also, *Quickplot*'s price is right: CSI gives the software away for no additional charge when you purchase a minimum of $300 worth of data.

A beginner in computerized technical analysis would do well to start with *Quickplot*. If you're a serious user, you'll want to collect data by modem from a data service, and CSI is a reliable data vendor.

For more than a decade, CSI has been an accurate supplier of data for commodity traders. In addition, CSI offers data on all optionable stocks on the New York Stock Exchange and most stock-price indexes.

Data collection and management can be complex parts of computerized technical analysis for beginners. Using *Quickplot* with the CSI database is a good way to start handling this important task. In fact, most

of *Quickplot*'s well-organized, 165-page user's manual is devoted to data collection and management.

ZOOM IN ON CHARTS A basic charting program, *Quickplot* will create a simple high-low-close bar chart with a volume histogram in medium-resolution color or in high-resolution black and white. The chart's automatic scaling is arithmetic only and well labeled. You can display 21 to 170 daily, weekly, or monthly periods on the screen along with three user-selected moving averages (simple, weighted, or exponential), trend lines, and parallel channel lines. You can add price oscillators (the difference between two moving averages) or Wilder's Relative Strength Index for any time period you select. You can calculate relative price/performance ratios between two stocks or commodities. The moving cursor points to the chart to identify precise numerical data-point readouts. *Quickplot* also features a zoom function so you can enlarge portions of the chart.

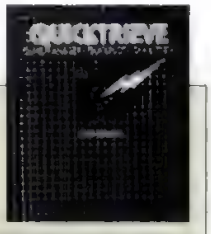
But don't expect anything fancy from *Quickplot* like time cycles, Gann angles, speed resistance lines, or volume studies such as on-balance volume. Nor does it have an autorun feature or any provision for user-developed studies or formulas.

Quickstudy, *Quicktrieve*'s profitability testing routine, simulates buy and sell strategies according to simple, trading-range breakout decision rules. The length of time in the trading range (or "window") is the sole parameter, and it may be optimized—if you have patience and the programming skills. Although CSI says *Quickstudy* can be a starting point for custom programming of your own technical trading system, the manual doesn't include the necessary programming instructions.

GOOD FOR BEGINNERS A thorough familiarity with an entry-level, "get-your-feet-wet" package such as *Quickplot* can introduce you to the complex field of computerized technical analysis. Since many other packages use the CSI data format, you could upgrade to a more sophisticated program later and still use the data files you accumulate using *Quickplot*. But this charting software, used with a good book on basic chart interpretation, is all many users will ever really need or find time for. And significantly, the price is right.

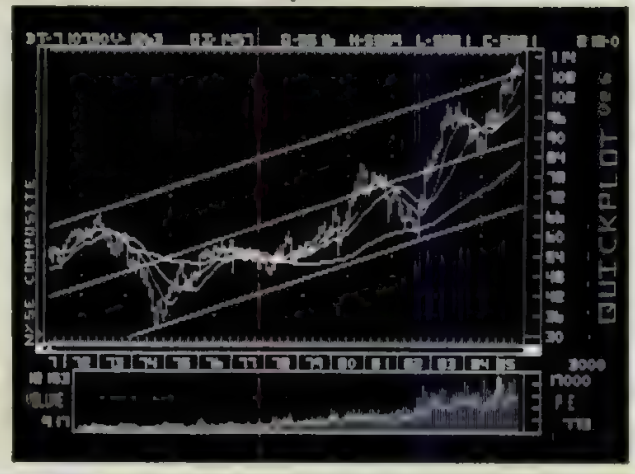
—Robert W. Colby

PC MAGAZINE FACT FILE



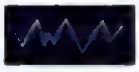
Quickplot
Commodity Systems Inc.
200 W. Palmetto Park Rd.; Boca Raton, FL 33432;
(800) 327-0175; (305) 392-8662 (in Fla.)
List Price: Free with data service (minimum $300 data purchase required); $150 for subscription, which includes 1 month service **Requires:** 256K RAM, two double-sided disk drives, color graphics adapter modem, DOS; printer recommended.
In Short: A simple, basic charting program that's a good place to start on a quest for computerized technical analysis; part of CSI's *Quicktrieve* package.

CIRCLE 656 ON READER SERVICE CARD



Quickplot's charts are basic, clear, and readable but offer nothing fancy.

RELEVANCE III



Relevance III is for the professional trader who wants hard copies of daily and weekly bar charts and is willing to use the study formats that are supplied. The number of charts you can display on your screen is limited.

The package is unusual in that instead of providing a main menu from which you can select different program functions, *Relevance III* consists of 13 individual programs that each plot different types of charts and studies. Each time you want to load a different program, you must reboot the system. This program structure makes the package unnecessarily complicated.

CHARTS AND STUDIES The programs consist of a wide variety of charts and studies. If you wish, the vendor will also provide custom studies. The daily chart series is made up of long- and short-term daily charts with two variable moving averages and cycle lines.

The "daily master chart indicator" series consists of long- and short-term daily charts with technical indicators that include Gann angles and resistance levels, cycle lines, two moving averages, stochastics percent D, volume, open interest, on-balance volume, Williams's percent R, and the Relative Strength Index.

The master research series provides daily charts with variable cycles and either Williams's percent R, Wilder's Relative Strength Index, or stochastics percent D.

The weekly chart series gives you weekly charts with Gann resistance levels and angles, two variable moving averages, and 5-week data printouts in the legend.

The Fibonacci series provides weekly Fibonacci cycle lines from highs and lows.

The "nearest futures masterchart" series provides "continuation contracts," which allow you to plot a continuous graph of the prices of futures contracts. It also includes everything found in the "perpetual contract master chart" series.

The daily weekly series charts futures continuation contracts on a daily and weekly basis.

The "perpetual contract master chart"

Helpful hints halt

✓ denotes IBM-AT compatibility.

SOFTWARE

We only carry the latest versions of products. Version numbers in our ads are current at press time.

Alpha Software
✓Keyworks ..... $49.
Ashton-Tate
✓dBase II 2.43 ..... call
✓dBase III Plus ..... call
✓Framework II ..... call
Best Programs
PC Connection 15-day money back guarantee on these Best Programs.
✓PC/Tax Cut *(1986 version for 1985 taxes)* ..... *special* 119.
✓Professional Finance Program 4.0 ..... 149.
✓PC/Fixed Asset System 3.0 ..... 329.
Bible Research
✓THE WORD 3.0 *(KJV Bible)* ..... 157.
✓THE WORD 3.0 *(NIV Bible)* ..... 157.
Borland International
✓Turbo Tutor 1.0 ..... 19.
✓Turbo Database Toolbox 1.2 ..... 30.
✓Turbo Graphix Toolbox 1.0 ..... 30.
✓Turbo Editor Toolbox 1.0 ..... 37.
✓Turbo Gameworks 1.0 ..... 37.
✓Turbo Newpak *(Gameworks and Editor)* 52.
✓Turbo Lightning 1.0 *(w/spelling dictionary and thesaurus)* ..... 57.
✓Sidekick 1.5 *(non-protected)* ..... 48.
✓Reflex 1.0 ..... 57.
✓Superkey 1.1 ..... 37.
✓Superkey/Sidekick Package *(includes $15 rebate coupon from Borland)* ..... 67.
✓Turbo Pascal 3.0 ..... 37.
✓Turbo Holiday Pak *(Pascal 3.0, Tutor, and Database Toolbox)* ..... 67.
✓Turbo Holiday Jumbo Pak *(Pascal 3.0, Database, Editor & Graphics Toolboxes, Tutor and Gameworks)* ..... 135.
BPI Accounting Software
✓General Ledger C.13 ..... 289.
✓Accounts Payable C.13 ..... 289.
✓Accounts Receivable C.13 ..... 289.
✓Business Builder ..... 399.
Breakthrough
✓Timeline 2.0 ..... 249.
Broderbund
✓Bank Street Writer ..... 49.
✓Print Shop ..... 35.
✓Graphics Library #1 ..... 22.
Dac Software
✓Dac Easy Accounting ..... 45.
✓Dac Easy Word ..... 32.
✓Dac Easy Payroll ..... 32.
Decision Resources
✓Chart-Master 6.1 ..... 237.
✓Diagram-Master 5.0 ..... 207.
✓Sign-Master 5.1 ..... 157.

PC Connection Software Special
through April 30, 1986

PAPERBACK SOFTWARE
✓VP-Planner 1.0

- Low cost replacement for Lotus 1-2-3
- Uses sparse matrix method to store data in worksheet, saving valuable RAM
- Compatible with 1-2-3 (1A) worksheets, macros and templates
- Can read, write, update and create dBase II and dBase III files directly from any worksheet
- Multidimensional Database consolidates and links multiple worksheets, saving much work

..... $57.

Enertronics
✓Energraphics 1.3 ..... 165.
Funk Software
✓Sideways 3.0 ..... 37.
Graphic Communications
✓Freelance ..... 189.
Harvard Associates
✓PC LOGO 2.0 ..... 89.
Harvard Software
✓Harvard Total Project Manager 1.0 ..... 289.
Infocom
✓Cornerstone 1.0 ..... 279.
Lifetree
✓Volkswriter 3 ..... 159.
Living Videotext
✓ThinkTank 2.0 ..... 109.
✓Ready 1.0 ..... 49.
Micro Education (MECA)
✓Managing Your Money 2.0 ..... 99.
Micropro
✓WordStar 3.31 ..... 179.
✓WordStar Propak 3.31 ..... 259.
✓WordStar 2000 Plus 1.01 ..... 299.
Microrim
✓R:base 5000 1.01 ..... 369.
Microsoft
✓Multiplan 2.0 ..... 119.
✓Microsoft Word 2.01 *(w/Ready)* ..... 247.
✓Microsoft Project 2.0 ..... 239.
✓Microsoft Chart 2.0 ..... 197.
✓Windows 1.0 ..... 65.
The following Microsoft mice now come with PC Paintbrush 3.0 software:
✓Microsoft Bus Mouse with software 5.0 135.
✓Microsoft Serial Mouse with software 5.0 135.
LANGUAGES
✓Quick Basic 1.0 ..... 69.
✓Pascal Compiler 3.31 ..... 175.
✓Macro Assembler 4.0 ..... 105.
✓Fortran Compiler 3.31 ..... $205.
✓Basic Compiler 5.36 ..... 235.
✓C Compiler 3.0 ..... 235.
Microstuf
✓Crosstalk XVI 3.6 ..... 95.
✓Remote 1.3 ..... 95.
MultiMate International
✓MultiMate 3.31 ..... call
✓Multimate Advantage 3.6 ..... call
Nantucket Software
✓Clipper ..... 349.
Paperback Software
✓VP-Planner 1.0 ..... special
Peter Norton
✓Norton Utilities 3.1 ..... 59.
Quarterdeck
✓DesqVIEW 1.0 ..... 65.
Satellite Software
✓WordPerfect 4.1 ..... 239.
Simon & Schuster
✓Webster's New World Speller 1.2 ..... 39.
Softstyle
✓Printworks 1.05 ..... 39.
Software Digest
Ratings Newsletter
Single copy ..... 24.50.
Year subscription ..... 245.00.
Software Group
✓Enable 1.1 ..... call
Software Publishing
✓PFS:Report B:01 ..... 77.
✓PFS:File B:01 ..... 84.
✓PFS:Graph B:01 ..... 84.
✓PFS:Write C:00 *(w/PFS:Proof)* ..... 84.
✓First Success *(Combo Pack includes PFS: Write, Plan, File & spelling checker)* ... 229.
Sorcim/IUS
✓SuperCalc 3 2.1 *(w/Sideways)* ..... 199.
Spectrum Holobyte
✓Art Studio ..... 32.
Springboard
✓Newsroom ..... 35.
✓Clip Art Volume 1 *(for Newsroom)* ..... 19.
Unison
Art Gallery 1 ..... 22.
Printmaster 1.1 ..... 37.
Xanaro
✓Ability 1.0A ..... call

TRAINING

ATI
✓*SKILL BUILDER PROGRAMS*
Intro and How To Use:
PC-DOS MS-DOS
Compaq Typing Tutor
IBM-PC BASIC ..... *each* 38.
✓*TRAINING POWER PROGRAMS*
How to Use:
dBase III Lotus 1-2-3 Wordperfect
Wordstar Displaywrite 3
Symphony ..... *each* 49.
INDIVIDUAL SOFTWARE
✓The Instructor II ..... 35.

For the IBM-PC (XT & AT) *Exclusively.*

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hardware hassles.

- Professor DOS ..... $47.
- Tutorial Set *(both items above)* ..... 75.
- Typing Instructor ..... 39.
- Training for Lotus 1-2-3 ..... 49.
- Training for dBase III ..... 49.

Scarborough Systems
MasterType ..... 26.

Simon & Schuster
- Typing Tutor III ..... 33.

EDUCATIONAL

Barron's
Computer SAT ..... 59.

Designware
Spellicopter *(ages 6 to adult)* ..... 25.
Grammar Examiner *(ages 9 to adult)* ... 27.

Eduware
Algebra 1, 2 or 3 ..... 22.

Harcourt Brace Jovanovich
- Computer SAT ..... 49.
- Computer GRE ..... 57.

Spinnaker
Educational Games for Young Computer Users. *(All require graphics board)*
- Face Maker *(ages 3 to 8)* ..... 18.
- Kids on Keys *(ages 3 to 9)* ..... 18.
- Fraction Fever *(ages 7 to adult)* ..... 18.
- Kinder Comp *(ages 3 to 8)* ..... 18.
- Alphabet Zoo *(ages 3 to 8)* ..... 20.
- Trains *(ages 10 to adult)* ..... 20.
- Delta Drawing *(ages 4 to adult)* ..... 27.

Stone *(requires graphics board)*
- My Letters,Numbers,Words *(ages 1 to 5)* 29.
- Kids Stuff *(ages 3 to 8)* ..... 29.

The Learning Company
- Reader Rabbit *(ages 5 to 7)* ..... 26.
- Rocky's Boots *(ages 9 and up)* ..... 32.

RECREATIONAL

Blue Chip
High finance simulations.
- Baron ..... 32.
- Millionaire ..... 32.
- Squire ..... 32.

Electronic Arts
- Pinball Construction Set ..... 25.
- Dr. J/Larry Bird One-on-One ..... 28.
- Music Construction Set ..... 28.

Friendlysoft
- PC Arcade ..... 35.

Hayden Software
- Sargon III *(highest rated Chess program)* 35.

Infocom *Difficulty levels shown in italics*
JUNIOR
- Seastalker ..... 25.

STANDARD
- Enchanter - the Witness - Planetfall
- Cutthroat - Wishbringer - Zork I
- Hitchhiker's Guide ..... *each* 25.

ADVANCED
- Zork II - Zork III - Sorcerer
- A Mind Forever Voyaging ..... *each* 29.

PC Connection
Hardware Special
through April 30, 1986

QUADRAM
QuadEGA+

- Combines four major video-display standards into one board:
  1. *Monochrome Text*—640 x 350
  2. *Monochrome Graphics*—720 x 384
  3. *Color Graphics*—
     320 x 200 *Medium*
     640 x 200 *High*
     with 16 colors out of 16
  4. *Enhanced Graphics*—640 x 350 with 16 colors out of 64
- Complete with 256k of video memory
- Supports the Virtual Device Interface
- Includes Monitor Select toggle switch (external)
- One year warranty

For IBM-PC, XT & AT ..... $369.

EXPERT
- Spellbreaker - Suspended .. *each* 31.

Invisiclues (hint booklets) are available for most Infocom games. Specify game. .. 6.

Microleague Sports
- Microleague Baseball ..... 25.

Microprose
- F-15 Strike Eagle ..... 22.

Microsoft
- Flight Simulator 2.12 *(now works with Hercules Mono Card)* ..... 32.

1Step Software
- Golf's Best *(Pinehurst)* ..... 32.
- Golf's Best *(St. Andrew's)* ..... 32.

Parlor Software
- Bridge Parlor *(best Bridge simulation)* .. 49.

PCSoftware
- Championship Blackjack ..... 23.

Sierra On-Line
- King's Quest II ..... 33.

Spectrum Holobyte
- GATO ..... 27.
- Tellstar *(w/Halley's Comet)* ..... 32.

Sublogic
- Night Mission Pinball ..... 29.
- Jet 1.3 ..... 33.

XOR
- NFL Challenge *(be the coach)* ..... $79.

HARDWARE

AST Research
All AST Boards come with a full one year warranty.
SixPakPlus 64k *includes Sidekick version 1.5 non-copy protected, & DesqVIEW* ..... 235.
384k *(fully populated)* ..... 279.
MegaPlus II 64k ..... 249.
I/O Plus II ..... 125.
Parallel, game, or second serial port for any AST board *(specify board)* ..... 35.
- AST-5251-11 ..... 579.
- Reach Modem *half card 300/1200 baud internal modem includes Crosstalk XVI* 349.
- Advantage 128k *upgradeable to 1.5 Meg includes Sidekick version 1.5 non-copy protected* ..... 379.

RAMpage! *upgradeable to 2Mb, fully supports* LOTUS/INTEL *expanded memory specification (EMS)* ..... call
- AT RAMpage! *upgradeable to 2Mb* .... call

Amdek
- Video 300A composite monitor *(amber)* 139.
- Video 310A mono monitor *(amber)* .... 169.
- Color 722 - RGB monitor *(EGA compat.)* 499.

Compucable
Plastic Keyboard & Drive Cover Set .... 17.
- IBM Mono Screen Enhancement ..... 17.

Cuesta
Uninterruptable power backup units
- Datasaver 400 WATT ..... call

Curtis
ACCESSORIES
- PC Pedestal *(for IBM Mono or Color)* ... 37.

Portable Pedestal ..... 47.
System Stand ..... 19.
- Universal System Stand ..... 23.
- Low Profile Tilt and Swivel Pedestal .... 37.
- Crystal 300-watt *(line conditioner)* ..... 159.

CABLES
- Smartmodem to IBM Cable ..... 17.
- Keyboard Extension Cable *(3 to 9 feet)* 27.
- Extension Cables for IBM Mono Display 33.
- Color and Monochrome Extension cables 39.
- Printer-to-IBM cable ..... 17.

SURGE SUPPRESSORS
- Safestrip ..... 21.
- Diamond *(6 outlets)* ..... 29.
- Emerald *(6 outlets; 6 ft cord)* ..... 36.
- Sapphire *(3 outlets; EMI/RFI filtered)* .... 47.
- Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* 55.
- Command Center ..... 123.

Epson
- DX-20 *(letter quality)* ..... call
- FX-85 *(80 column)* ..... call
- FX-286 *(replaces FX-185, 136 column)* call
- LX-80 printer *(80 column)* ..... call
- LX-90 printer *(80 column)* ..... call
- LQ-1000 *(letter quality dot matrix)* ..... call

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230M

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- Printer-to-IBM cable ..... $15.

We are an authorized Epson service center. Ask about the extended service plan.

Hayes

- Smartmodem 300 ..... 149.
- Smartmodem 1200 ..... 389.
- Smartmodem 1200B *(w/Smartcom II)* .. 349.
- Smartmodem 1200B *(no software)* .... 289.
- Smartmodem 2400 ..... 579.
- Smartmodem 2400B *(w/Smartcom II)* .. 539.
- Smartcom II 2.1 *(software)* ..... 89.

Hercules

- Hercules Color Card *(parallel port)* .... 169.
- Hercules Graphics Card *(parallel port)* 299.

Innovative Concepts

- Flip n' File 50 ..... 16.
- Flip n' File 50 w/lock ..... 21.

Intel

Above Board PC ..... call
- Above Board AT ..... call

Above Board PS *(multifunction board)* .. call
8087 *(for IBM-PC & XT)* ..... 129.
8087-2 *(works on 8mhz clockspeed computers)* ..... 139.
- 80287 *(for IBM-PC AT)* ..... 225.

Kensington Microware

- Masterpiece ..... 94.
- Masterpiece Plus ..... 129.
- Printer/portable computer stand ..... 17.

key tronic

5150 keyboard ..... 115.
5151 keyboard *(deluxe)* ..... 169.
5153 keyboard *(with touch pad)* ..... 289.

Kraft

- Joystick ..... 29.
- Executive Cursor Control *(w/Joystick)* ... 47.

Mouse Systems

- PC Mouse with PC Paint+ ..... 139.
- PC Mouse w/Ready ..... 139.
- PC Mouse w/Ready and PC Paint+ ... 159.

Orchid Technologies

Conquest Multifunction Board *Øk fully supports* LOTUS/INTEL *expanded memory specification (EMS)* ..... 264.
PC Turbo 186 w/256k and Daughter Board *expandable to 640k* ..... 599.
- Eccell Multifunction Board for the AT *Øk upgradeable to 1 Meg, fully supports* LOTUS/INTEL *expanded memory specification (EMS) and Error Correction Code (ECC), (serial and parallel ports optional)* 399.

Paradise Systems

- Color/Mono Card ..... 149.
- Modular Graphics Card ..... 275.
- Five Pack w/384k ..... 169.

PC Designs

FD 1000 Computer ..... 789.

PC Magazine called it "a top performance bargain" (Oct. 15). *PC Week* called it "a terrific machine at a terrific price" (May 10).

Please call for more information about this computer.

Princeton Graphics

- HX-12 RGB monitor *(690 x 240)* .....$449.
- HX-12E RGB monitor *(EGA compatible)* 589.
- MAX-12E Amber monochrome monitor 179.

Quadram

Expanded Quadboard *with clock calendar, parallel, serial & game port, I/O bracket, and Quadmaster software.*
384k *(fully populated)* ..... 249.
Øk *(upgradeable to 384k)* ..... 189.
Gold Quadboard Øk ..... 387.
Silver Quadboard Øk ..... 249.
Quad Sprint *w/8086 processor* ..... 479.
- Microfazer Printer Buffer *(parallel) w/copy MP 64 (64k) upgradeable to 512k* ..... 159.
- QuadEGA+ ..... special

SMA

PC-Documate Keyboard Templates *available for:*
DOS/Basic 2.0-2.1
- dBase III
- DOS/Basic 3.0-3.1
- Lotus 1-2-3
- Symphony
- Framework
- Wordstar
- Wordstar 2000
- Turbo Pascal
- WordPerfect
- Multimate ..... *each* $12.

Titan Technologies

Accelerator PC 256k ..... call

Toshiba

All Toshiba printers listed are 24 pin dot matrix.
- P1340 printer *(80 column)* ..... 439.
- P341 parallel printer *(136 column)* ..... 749.
- P351 parallel printer *(136 column)* .... 1089.

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- We accept VISA and MASTERCARD.
- No surcharge added for charge cards.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- Net accounts pay actual shipping.
- No sales tax.
- All shipments insured; no additional charge.
- Allow 1 week for personal and company checks to clear.
- UPS Next-Day-Air available.
- COD max. $1000. Cash or certified check.
- 120 day limited guarantee on all products.*
- To order, call us anytime Monday thru Friday 9:00 to 9:00, or Saturday 9:00 to 5:30. You can call our business offices at 603/446-3383 Monday thru Friday 9:00 to 5:30.

SHIPPING

Continental US: For monitors, printers, and drives, add 2% for UPS ground shipping. Call for UPS Blue or UPS Next-Day-Air. For all other items, add $2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. **Hawaii:** For monitors, printers, and drives, actual UPS Blue charge will be added. For all other items, add $2 per order. **Alaska and Outside Continental US:** Call 603/446-3383 for information.

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DRIVES

All floppy drives are completely pre-tested and are supplied with a printout of the test results. They are shipped with complete step-by-step installation instructions. Drives are 320k/360k.

Control Data (CDC)

(5¼") half-height drive *(DS,DD)* ..... 79.

IOMEGA

- Bernoulli Box 20 Meg w/PC2 card.... 2349.
- 10 Meg cartridge ..... 48.
- Bernoulli Box 40 Meg w/PC2 card..... call
- 20 Meg cartridge ..... 67.

We are an authorized IOMEGA service center.

Mountain Computers

- Drive Card 20 Meg ..... call

Seagate

20 Meg Internal Hard Drive *(w/controller, cables)* ..... 469.
- 20 Meg Internal Hard Drive for the AT 569.

Toshiba

- AT 360k Drive (5¼") *half-height drive* ... 99.

MEMORY

64k Memory Upgrade Set for IBM-PC or XT system board or any memory board
150 nanosecond *(set of 9)* ..... 15.
200 nanosecond *(set of 9)* ..... 12.
Install memory upgrades & run diagnostics *at time of board purchase only* ..... 10.
- 256k Memory Upgrade Set for any IBM-AT memory board *(9 chips)* ..... 39.

DISKS

DS/DD Disks for the PC & XT (40 TPI). *10 disks per box.*
Maxell MD-2 ..... 19.
Verbatim Datalife ..... 19.

DS/High Density Disks for the AT (96 TPI). *10 disks per box.*
- Fuji ..... 35.
- Maxell ..... 39.
- Verbatim ..... 45.
- Flip Sort *(holds 75 disks)* ..... 15.

INFORMATION SERVICES

Compuserve

- Compuserve Information Service *(includes subscription, manual, 5 hours of connect time, monthly publications)* .... 27.

Dow Jones

- Membership Kit ..... 19.

CIRCLE 339 ON READER SERVICE CARD

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PC Ph.D.

ROM isn't built in a day.

When our new employees arrive for their first day of training here in the ivy bowers of Marlow, NH (pop. 550), they think they know it all. Oh, how wrong they are. In a matter of weeks, we cram so many computing caveats and counsels into their craniums that they often wish they were back in pre-med. Because we won't let them sell you PC products at super low prices until they know how to use the darn things.

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That's because our crew of plucky pundits knows why your printer is printing garbage.

They can guide you through your hard drive installation, step-by-step. They even know how to capture babble fish and unlock the secrets of Vogon poetry.

So whether you're upgrading by degree, or looking to change your micro concentration, call us toll-free for a quick tutorial.

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A one year subscription to Yankee magazine, the classic monthly compendium of life up here in the north country. Limit one per customer. Offer not available to commercial accounts.

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series includes weekly and daily charts and all the technical indicators and studies contained in the daily master chart technical indicator series.

The precise scale series provides daily charts in Gann format with two variable moving averages and 5-day data printout in the legend.

The "weekly master technical indicator" series consists of weekly charts of any contract including Commodity Systems Inc.'s perpetual and nearest futures contracts with up to 6 years of price history (although I was unable to download the entire 6 years), in addition to the indicators mentioned above.

The long-term masterchart series provides long-term charts of daily, weekly, and nearest futures continuation contracts with 18 studies.

The systems series features a user-definable "N" day parameter for entering and exiting a position or for setting "stops" to help you minimize risk. This series also contains an "N" day parameter that you can vary to help you perform profit-and-loss analysis.

The screen analysis series charts a daily, weekly, or monthly chart on your screen for quick review; this chart series will not print. The program also offers 12 technical indicators and optional high-resolution color graphics.

The long-term chart series gives long-term weekly charts with up to 10 years of price history (available only in the screen graphics series).

While the Gann studies and Fibonacci cycle studies are interesting features, the package does not execute them correctly. The program automatically draws Gann lines only from the high or low points shown on a particular chart. It should draw the lines from significant points, even if they occur before the period shown on that chart. Fibonacci cycle lines suffer from the same restriction.

CHOOSING PARAMETERS Automated procedures make the charts relatively easy to set up. The package can convert daily data to a weekly format and produce charts for both. In addition, it prints the last 5 days or weeks of price data and indicator levels at the top of each chart for easy reference. You can choose any file of commodity or stock price data, and the package will print charts and studies automatically.

While you are restricted to plotting 240 or 100 days' worth of daily price data on the charts, you can vary the time parameters of each indicator. The program does have a standard list of parameter values that can be used for creating charts, but you can also change these values and create charts with the new parameters. If you like, you can plot a single indicator using five different time parameters for research purposes.

The quality of the high-low-close bar charts is excellent, but the indicator charts are difficult to interpret because the printouts look rather sketchy. In addition, charts are scaled from their high and low points and divided into eighths (Gann format), making it difficult to see precise price levels—which are especially important when determining entry or exit points. You cannot adjust scales, nor do scales appear on the printed oscillator charts.

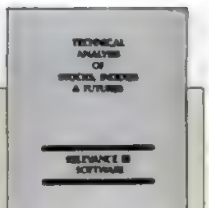
The input screen for specifying indicator time periods could also be easier to use. The program prompts you to enter each of the parameter values in a certain sequence rather than simply listing them on the screen. Thus, if you want to change one of the parameters, you have to go through the entire sequence.

Another drawback for those wishing to use *Relevance III* for research purposes is that instead of being able to scroll back and forth to see various time periods on the chart, you must go to the Commodity Systems database, create a file that holds the price data for the time period you want to evaluate, and then run the chart from that file. This is a time-consuming and cumbersome extra step.

The charting has no zoom feature. Also, the package has no escape function. The only way you can interrupt a charting procedure is to reboot the system.

DATA RETRIEVAL You can retrieve data automatically via modem from Commodity Systems Inc. CSI offers both daily and historical data on most cash indexes, commodities, commodity options, equity options, option indexes, money markets, selected U.S. Government Treasury issues, Treasury bills, and approximately 750 stocks. A monthly newsletter includes a list of any data errors that have occurred—something that most data services

PC MAGAZINE FACT FILE



Relevance III
Holt Investments
First American Center; Nashville, TN 37238; (615) 242-9217
List Price: $650 **Requires:** 256K RAM, two double-sided disk drives, color/graphics card.
In Short: Offers a number of interesting charts and studies, but the package is cumbersome to use.

CIRCLE 640 ON READER SERVICE CARD



At the top of each chart are the last 5 days or weeks of price data and indicator levels.

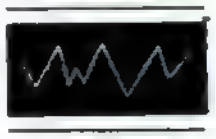
do not offer. Manual updating and correction are possible through CSI's *Quick Manager* program.

At first, the manual appears overwhelming, but the text is actually under 40 pages. The rest is mainly examples of charts. It does include a bibliography and several in-depth articles on Fibonacci analysis. But it lacks a tutorial, glossary, explanation of error messages, and index. A big problem with the package is its lack of support. Only the developer is able to answer questions, and he was very seldom available.

You'll need patience to figure out how to use the package because it is unnecessarily cumbersome and offers little, if any, product support. However, the package does have a number of interesting studies. And if you've researched and tested several indicators, know which ones you want, and can find them in *Relevance III*, this package could be for you.

—Ronald F. Daino

STOX/C



At $79.99, *STOX/C* from the Sydney Development Corp. initially seemed like an inexpensive way to analyze both individual stocks and the overall market. It includes two widely followed indicators, Wilder's Relative Strength Index and Joe Granville's on-balance volume, as well as some of the developer's own proprietary studies.

You can download price data from Dow Jones News/Retrieval service and Warner Communications. Unfortunately, the first disk I received wouldn't accept data automatically because of an error in the program. The vendor suggested that I try turning the computer off and on to solve the problem. It didn't. Then a replacement disk had the same difficulty. Obviously, there is little quality control. If you choose to manually update the data, you are required to input the date, high, low, close, and volume for each item.

NINE STUDIES Once the data is in place, you can choose from nine different studies. The price study is a bar chart depicting the high, low, and close prices. You can select a time period ranging from 1 to 999 days (although I've never heard of anyone using more than a 50-day parameter) to perform studies using Wilder's Relative Strength Index. The filter study, which is new to me, is a "first order adaptive digital filter" that you can also test using time periods from 1 and 999 days. The trend study displays the price trend seen by the filter. In addition, you can calculate two moving averages, a 4-day and one of your choice between 5 and 999 days. The package looks at the difference between the 4-day moving average and the selected average. A graph of Joe Granville's on-balance volume (OBV) can be displayed with the price superimposed for easy comparison. You can graph price momentum, the product of the price change and the trading volume, which can be averaged between 1 and 999 days. And finally, *STOX/C* graphs point and figure charts with the chart size automatically calculated to fill the screen. You can choose to plot price reversals of $1 to $5.

STOX/C's manual gives a brief description of each of the studies, but it does not adequately explain the ones developed specifically for this package: filter, trend, and momentum indicators. It gives no guide as to which time parameters would be most useful or the elements that make up these studies. Also, the manual does not give examples of how you would use them or provide any results of how these unfamiliar studies have performed in the past. Thus, I would be reluctant to risk any of my capital on such unfamiliar and untested studies.

LIMITED CHARTS Point and figure charting capabilities are limited. Each file can hold only 256 days of data, and old data is dropped to make room for current data. Since point and figure charts are considered an intermediate to long-term analysis technique, such charts would need at least 3 to 5 years' worth of data to be truly useful. A 1-year point and figure chart is of little use because it offers such a limited perspective. You can plot two moving averages per chart, but the package restricts you to a 4-day moving average as one of your choices.

The package includes no split-screen function. Instead, it overlays on-balance volume onto the price chart, making both

PC MAGAZINE FACT FILE

STOX/C

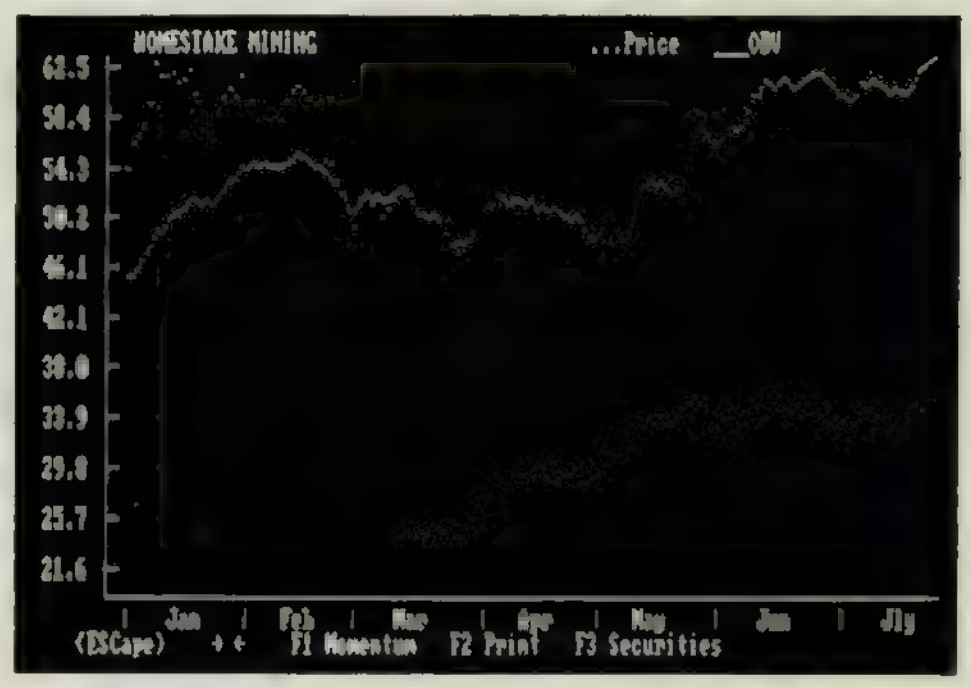
Sydney Development Corp.; 600-1385 W. 8th Ave.; Vancouver BC, Canada V6H3V9; (609) 734-8822; (800) 663-6957 (in Canada)

List Price: $79.99 **Requires:** 128K RAM, one single-sided disk drive, color graphics card, DOS 1.1 or later.

In Short: Offers an interesting variety of indicators but has several problems and lacks good product support.

CIRCLE **659** ON READER SERVICE CARD





STOX/C overlays OBV onto the price chart to facilitate comparison.

difficult to read. In addition, the package displays only 120 data points, or 6 months' worth of data, at once. You can, however, scroll the screen forward and backward to see all dates for which you have entered data. You also have no way of rescaling your charts, and no autorun feature is available.

While the documentation is quite easy to follow, product support is a problem. I was told that support would be available 9 a.m. to 5 p.m., Monday through Friday. But when I called I was told that only one person was available for support, and he was away for 2 weeks.

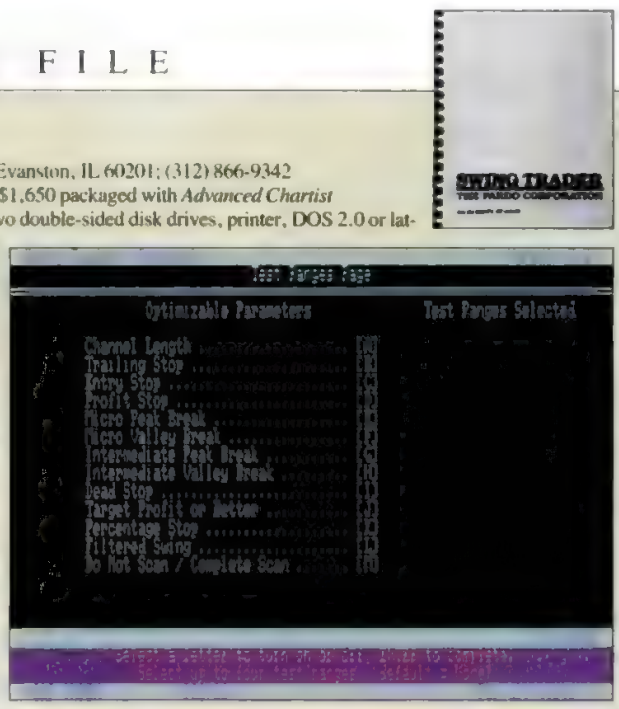
With its variety of indicators and low price, *STOX/C*, at first glance, seemed fairly interesting. But considering all the problems and lack of support I encountered, I find it very difficult to recommend it. With *STOX/C*, the bottom line is that you get what you pay for.

—Ronald F. Daino

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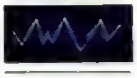
Swing Trader
Pardo Corp
1615 Orrington, #C202; Evanston, IL 60201; (312) 866-9342
List Price: $1,440 alone; $1,650 packaged with *Advanced Chartist*
Requires: 256K RAM, two double-sided disk drives, printer, DOS 2.0 or later; modem recommended.
In Short: A unique product with a scientific approach that offers a complete, objective trading plan through multivariable model building

CIRCLE 671 ON READER SERVICE CARD



This menu allows you to select, test, and find the best parameters that would have optimized your profits for the historical price data that you supply.

SWING TRADER



Swing Trader takes a different approach to market analysis than most programs: model building. It allows you to create, test, and optimize complex, multivariable trading strategies for commodities, stocks, bonds, or options. This complex program is sold separately or as part of a package with Pardo's *Advanced Chartist* (reviewed in this issue), which is a charting program.

You'll need several days to become familiar with *Swing Trader*, but its objective, scientific approach to market analysis should interest you. Here's how it works: You use your PC to search for the best combination of trading rules from a large menu. Then you use your model to generate specific and objective buy and sell orders.

Swing Trader does not offer ordinary technical analysis as popularly practiced, however. Most available software calculates and draws a variety of lines on a graph, and then you interpret the patterns and signals, introducing the element of individual subjectivity. In contrast, *Swing Trader* offers no graphs. Instead, it produces a variety of informative profitability reports printed in tables and completely objective trading orders—graphic capabilities are not required, but a printer is.

TESTING MODELS To develop and test a model, you'll need at least 4 to 6 months of daily data. If you're a longer-term investor, you can use weekly or monthly data. The program requires open, high, low, and close prices for the selected time interval, but not volume data.

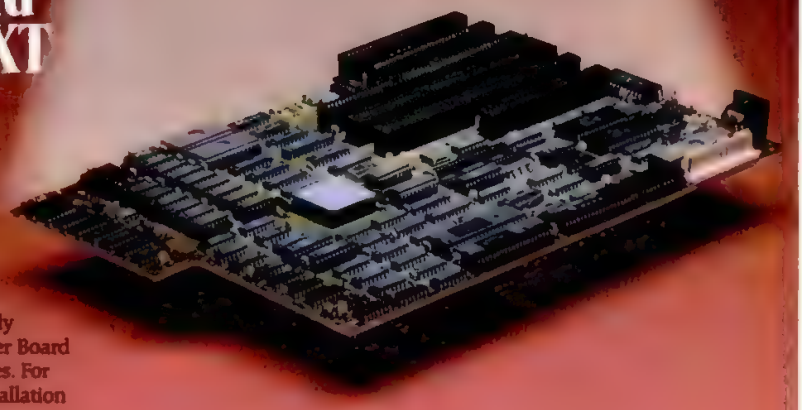
You'll probably want a good on-line database for gathering historical quotes. The new Version 3.0 of *Swing Trader*, available in February 1986, can access any of eight to ten databases—including Dow Jones News/Retrieval, CompuServe, Warner Computer Systems, and Remote Computing—in addition to the Commodity Systems Inc. (CSI) database, which is the only one that Version 2.1 of *Swing Trader* can use. Entering data by hand is also easy, although more time consuming.

One of the common problems with optimized models is that they don't last. The "best" set of parameters and rules in any past period will not necessarily be the best set in any future period, because the markets go through many different phases of lethargy and activity. To deal with this well-known market characteristic, the vendor recommends that you test and reoptimize your models frequently so that you'll always be closely in tune with the markets' current mode.

GETTING STARTED To get you started, the user's guide has a tutorial that uses soybeans as an example. One by one, you select, test, and find the best parameters that would have produced the maximum profit for the historical data you supply. One of the most important optimizable variables, for example, is the entry stop, which tells you how much risk you should allow from your trade opening price to your cut-loss point, which becomes an actual stop-loss order in the program.

The many other variables to be tested include trend line and pivot-point penetration rules, overbought/oversold rules, optimum channel length, and so forth. Some of these variables take some getting used to, because you may not have previously thought in these terms. But don't worry; let your computer do the walking through the complex maze of variables.

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New CSS Mother Board blesses IBM PC and XT with heavenly AT performance.

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Most important, the CSS solution is fully compatible, so there's no need for special software. And to safeguard the user's hardware investment, our Mother Superior Board works perfectly with most existing peripherals and add-on boards.

Check the specs and get more facts by contacting: CSS Laboratories, Inc., 2134 S. Ritchey St., Santa Ana, CA 92705. Telephone (714) 540-4141. Telex 3720012.

XT 286 Key Features

- 512KB memory, expandable to 4MB
- 64KB ROM contains Award software AT BIOS
- High-performance 80286 microprocessor
- Six expansion slots, three 16 bit and three 8 bit slots
- 7 channel direct memory access
- Real-time clock
- 6 MHz, switch selectable to 8 MHz
- 16 level interrupt
- Speakers for audio/music applications
- Automatic self-test at power on
- Support PC and AT keyboards
- AT set-up software enclosed
- One year limited warranty

CSS LABORATORIES, INC.

2134 S. Ritchey St., Santa Ana, CA 92705 (714) 540-4141

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XT 286-AT Motherboard is a trademark of CSS Laboratories, Inc

CIRCLE 537 ON READER SERVICE CARD

TWO DISADVANTAGES The main disadvantage of *Swing Trader* is its complexity. Plan on spending many weeks—even months—experimenting with this relatively new approach. To help you learn, the vendor plans to offer a revised manual and a regular newsletter.

Moreover, the software is relatively expensive at $1,440. With the time and expense *Swing Trader* involves, though, you might consider it an advanced course in trading strategy. (The vendor makes the point that nonprofessionals may do better with *Swing Trader* than professional traders, since the program gives very clear, plain-English directions for trading without the biases and preconceptions that professionals may bring to bear.)

VALUABLE EDUCATION Adequately judging the effectiveness of *Swing Trader* would require building and tracking a variety of trading models with it over many months, which was impossible for this review. Undoubtedly, though, *Swing Trader* is an interesting and unusual research tool. A few months of studying the program should give you quite an education about trading and modeling.

The philosophy behind the approach alone should be of significant value to the inexperienced trader; simulating trades with your PC is far safer than risking your capital on some vague or untested strategy. With *Swing Trader*'s unique, scientific approach, you can create an entirely objective, disciplined trading plan.

—Robert W. Colby

TECHNICAL INDICATOR PROGRAM



If you already have a good technical analysis package but want to add some specialized breadth indicators to your analysis, go no further. *Technical Indicator Program* from Investment Software allows you to acquire these specific market tools for an economical $89.50.

Technical Indicator Program uses breadth indicators that measure overbought/oversold conditions and distribution/accumulation patterns (these monitor the activity of the so-called smart money) to evaluate the overall stock market, not individual stocks.

The technical indicators available include the advance/decline line, McClellan oscillator, McClellan summation index, short-range "magic T" oscillator, intermediate-range "magic T" oscillator, trader's index, 10-day trader's index, 40-day trader's index, 10-day high/low oscillator, 18-day high/low oscillator, 18-day advance/decline oscillator, 36-day advance/decline oscillator, 18-week volume oscillator, and 36-week volume oscillator.

The indicators in this package are fixed, meaning that you can't experiment with them, for example, by varying their parameters. However, in this package's defense, the fixed parameters are an integral part of many of the indicators included in the package.

EASY MANUAL UPDATES Although you must manually input data, once you find a routine, updating is a breeze. You enter six items of data daily: the number of advancing and declining issues, advancing and declining volume, and the number of new highs and new lows. All of this data is available from the *Wall Street Journal*. If you want a historical perspective for research purposes, you can purchase New York Stock Exchange data for 1976 to the present from Investment Software at $10 per year.

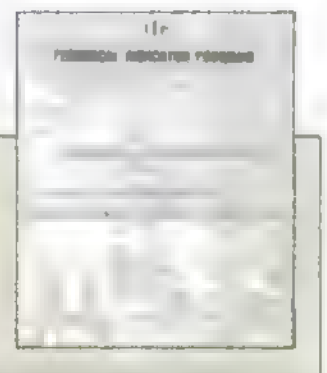
While you would normally use NYSE data for updating, you can also enter data for the American Stock Exchange (AMEX) and the over-the-counter (OTC) markets. Because the public tends to purchase less expensive, smaller OTC stocks before the NYSE, some technicians compare trends of the two markets, looking at whether the markets participate (move in the same direction) or diverge from each other. If the Standard & Poor's 500 Index is strong and the NASDAQ weak, for example, larger investors are participating in the market while smaller investors are not. Thus, the ability to track data on all of these markets can be an important benefit.

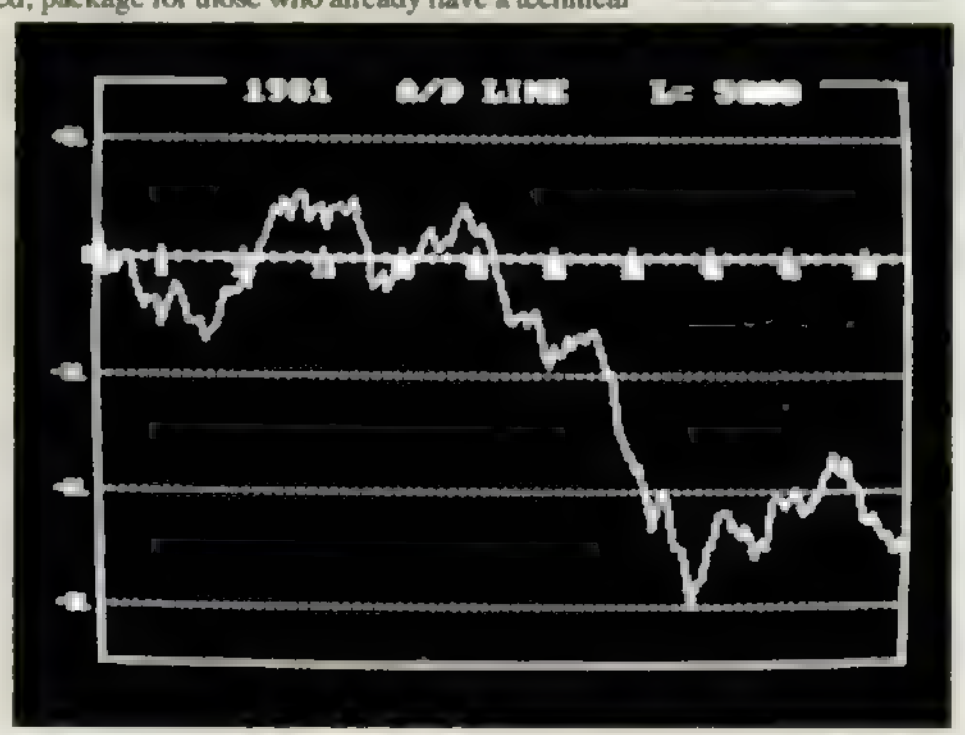
Daily charts are easy to generate but hard to read. The chart's horizontal axes are labeled with numbers representing weeks 1 to 52, not with specific dates. Although the program has a date-conversion

PC MAGAZINE FACT FILE

Technical Indicator Program
Investment Software
P.O. Box 2774; Durango, CO 81302; (303) 563-9543
List Price: $89.50 **Requires:** 128K RAM, one single-sided disk drive, color/graphics card, DOS 2.0 or later.
In Short: A good, if limited, package for those who already have a technical analysis package but want to add 18 specialized breadth indicators to their analysis arsenals.

CIRCLE 648 ON READER SERVICE CARD





The horizontal axis of this chart of an advance/decline line is labeled not with specific dates, but with numbers representing weeks 1 to 52.

Conceived on a Mainframe... Born on an AT

Ask a CPA about accounting software for PCs, and chances are he'll recommend an accounting package with multiple modules. If the package runs under PC-DOS, it probably won't support multiple users... at least in terms of supporting multiple users *within* each module.

But ask him what would be ideal for your organization, and he'll probably tell you that a true multi-user accounting system would be perfect.

Until now, this kind of system couldn't be found... couldn't run under PC-DOS, and couldn't run on hardware other than minis and mainframes. That is, until NetProfit™

NetProfit™ Will Change The Way You Think About Accounting Software...Forever. In use on large systems for over eight years, NetProfit™ enables you to use your accounting database as a powerful decision-making tool.

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The Multi-User Accounting System

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feature, this additional step is a bother. Another drawback is that you can plot only one indicator per screen. This limit restricts your ability to see the total picture. In addition, data cannot be compressed into weekly or monthly formats, which would be helpful for evaluating weekly high/low data for long-term analysis.

The automatic print, plot, and display features will handle up to 12 indicators and can save you quite a bit of time.

WELL SUPPORTED The manual is well written and easy to follow from its description of the installation to the explanations of functions and commands. Product support is available every morning and evening; my questions were answered in a professional manner.

The package and manual assume that you are already proficient with use of all the studies. While the manual briefly discusses the oscillators, you'll need additional reference material for in-depth interpretation. The manual does list references so that you can get in touch with the developer of the indicators.

The package has its clumsy points. For example, when you finish charting or end a session, you must press Ctrl-Alt-Del to get back to the function menu. Also, while you can install the program on a hard disk, you must store your data on a floppy disk.

Investment Software plans to expand its product line with two complementary programs, one for analysis of individual stocks, the other for developing custom market indicators. You will be able to purchase all three separately or together.

For now, *Technical Indicator Program* is a good, manually updated package, filling a narrow niche at a reasonable price.

—Ronald F. Daino

TELESCAN ANALYZER



Telescan Analyzer from Telescan Inc. is a program and on-line database combination for technical analysis that can retrieve and analyze more than 7,000 stocks and 150 market indexes, including the Standard & Poor's industry groups. Some of the data files it accesses go back as far as 1973. What makes this system unique, however, is that you retrieve and save the actual charts from the service, rather than data alone. It also displays the latest financial news.

At $49.95, *Telescan Analyzer* is priced right if you're interested in analyzing your own or your clients' portfolios on a limited budget, even though, technically speaking, the program has some limitations. But low-cost data and ease of use make this program attractive for those investors who want to include some technical indicators in their overall analyses.

LIMITATIONS Fairly limited technically, *Telescan Analyzer* gives you six indicators: moving averages, momentum, cycle analysis, relative strength, on-balance volume, and trend lines. You can perform four of these six technical functions off-line, but you can do relative-strength and on-balance volume calculations only on-line.

You can plot one or two standard or exponential moving averages off-line with *Telescan Analyzer*. You can also graph the difference between the two moving averages or between the closing price and the average (they are difficult to see, however). The program lets you store the moving averages for each issue.

Although *Telescan Analyzer* offers basic momentum analysis, it is not nearly as sophisticated as that of other packages on the market. As with moving averages, you can perform this function off-line and store the momentum parameters for each issue.

The program's cyclical analysis function is unique. You can expand the cycle, contract it, and move it up or down and left or right (amplitude) to obtain the best cyclical fit. At the bottom of the screen, it shows you the period of the cycle, the projected date of the next top, and the projected date of the next bottom.

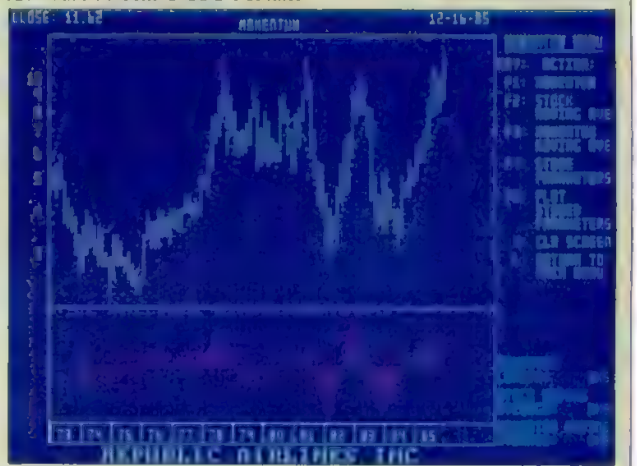
Relative strength, available on-line only, allows you to compare a stock with the overall market. Oddly enough, this program does not include the Standard & Poor's 500 Index, the industry standard. In addition, most programs show the relative-strength line below the price; *Telescan Analyzer*, however, superimposes the information over the price chart, which I find confusing.

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Telescan Analyzer
Telescan Inc.
11011 Richmond Ave., # 600; Houston, TX 77042; (713) 952-1060
List Price: $49.95 plus $5.00 postage and handling. Data retrieval 50 cents per minute, 25 cents per minute evenings. **Requires:** 256K RAM, color/graphics adapter, Hayes-compatible 1200-baud modem. DOS 2.1 or later.
In Short: A bargain-rate program and on-line database combination that lacks many innovative analysis tools but gives you all the up-to-the-minute data for analysis.

CIRCLE **655** ON READER SERVICE CARD





Telescan Analyzer's cyclical analysis function is unique. You can adjust it to obtain the best fit.

Also available on-line only is on-balance volume, an indicator developed by Joseph Granville, which takes both price and volume into consideration. Some technicians find it to be a useful indicator.

In addition, *Telescan Analyzer* gives you both standard and parallel trend lines. You can perform this function off-line. You also get such fundamental information as earnings, cash flows, insider trading, capital spending, short interest, and price/earnings ratios. The program also allows you to adjust the charts to show the impact of inflation.

ON-LINE ADVANTAGE *Telescan Analyzer* is easy to use—a definite advantage. Within a very short time, especially compared with the time required for other programs on the market, you can set up, log on, and start saving the information that you need.

Another big advantage of *Telescan Analyzer* is that it's not only inexpensive in itself, it also helps you keep down the cost of data retrieval. Since *Telescan Analyzer* is an on-line database, you never have to download data. You simply retrieve and save the charts you want. You can then perform most of the analysis functions off-line. Also, the program's customize-program function allows you to list the most frequently accessed stocks for quick display while on-line.

The time you are on-line is kept to a minimum. If you use the database at the lower, 25-cent-per-minute evening rate, you could follow 25 stocks, for example, for as little as $12 per week, allowing 45 seconds to retrieve and save each stock.

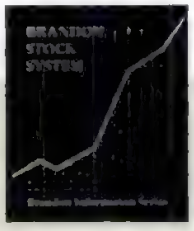
You can also purchase an optional software maintenance program that reduces the daytime cost to 17 cents per minute and the evening cost to 8 cents per minute. The cost of the optional program is $300 a year. Automatic updates of the program and access to technical support through a toll-free line are included.

DOCUMENTATION The *Telescan Analyzer* manual is clear and easy to follow for the most part, with 64 pages of detailed instructions. It also lists the stocks and the indexes available for retrieval. The manual neglects to mention, however, some handy information—that you can choose one of two sizes for the charts from the program's installation mode. I had to call *Telescan*'s technical support representatives to find out how to adjust the size of the charts.

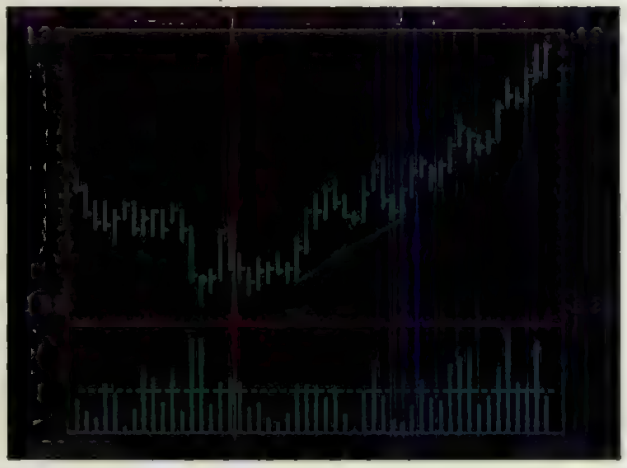
LOW COST All in all, *Telescan Analyzer* is great if you need a large amount of up-to-the-minute charts for technical analysis at low cost. The program is not recommended if you want to use it as your primary technical analysis software, particularly since it lacks advanced technical indicators like stochastics and a moving-average convergence/divergence trading system. But at $49.95, the easy-to-use *Telescan Analyzer* is truly a bargain.

—Ronald F. Daino

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***The Brandon Stock System*, Version 2.1**
Brandon Information Management
615-N 666 W. Germantown Pike, Plymouth Meeting, PA 19462,
(215) 828-3249
List Price: $325 **Requires:** 128K RAM, two double-sided disk drives, color/graphics adapter, DOS 1.1 or later; modem and printer recommended; Graftrax option must be installed on Epson MX or FX series.
In Short: A limited technical analysis package that plots few indicators and has below-average graphics.



The Brandon Stock System *labels the time axis inadequately and displays a maximum of only 90 days of data.*

THE BRANDON STOCK SYSTEM



The Brandon Stock System is apparently designed primarily to give specific buy and sell signals using a proprietary "convergence and divergence" methodology for predicting price trends. Although the package has a few other graphic charting tools, overall it's quite limited, with just a few indicators and below-average graphics.

LIMITED INDICATORS You can plot few indicators with *The Brandon Stock System:* on-balance volume, percentage daily price change times volume, average daily trading volume, comparison charts of two securities, relative price/performance ratios, and the proprietary "convergence and divergence" price trend indicator. You can fit trend lines on the graphs, but they require a good eye to draw, and you may have to draw them a few times to obtain a good fit.

Graphics are available in pretty colors, but options are few. The scaling, which you cannot define, is particularly inflexible. The program labels time delineations inadequately, only at the extremes. On the vertical price axis, however, you can choose between arithmetic and semilog scaling.

The Brandon Stock System displays only 90 days of trading data in high resolu-

tion and 50 days in medium resolution—the poorest time perspective I've seen in any technical analysis software program. You can "move" your chart back to a previous time period or forward to the most recent date by using the cursor keys on the PC. *The Brandon Stock System* has no zoom feature. The latest version of the program, Version 2.1, allows you to construct a weekly graph; this graph curiously notes no dates, however.

Installing the program and using it are both easy (although understanding the proprietary "convergence and divergence" formula is difficult, a fact that makes its ease of use lose much of its significance). The program is menu driven, and help screens are available at certain points. You can enter data either manually or download from an on-line database with a modem. When you gather and update data using a modem, the program accesses one on-line database, Dow Jones News/Retrieval. Using only Dow Jones News/Retrieval means that you can collect only 1 year of daily price history.

SUPPLEMENTARY DOCUMENTATION *The Brandon Stock System* documentation is a 69-page loose-leaf manual. No tutorial is available. About a third of the documentation is devoted to introducing the system, listing equipment requirements, and detailing the program's installation process.

The program itself contains some "hidden" documentation, which you can access on the system disk and print out. This supplementary documentation, which explains the program's "convergence and divergence" formula, is actually more explicit than the manual.

DIFFICULT TO ASSESS *The Brandon Stock System*'s proprietary price trend methodology, the convergence and divergence formula, was difficult to assess, especially with the limited data file supplied. The system looked confusing and difficult to follow. Even with the diagrams that are included in the explanation, you have to reread it many times to try to clarify the procedure.

Moreover, the Dow Jones News/Retrieval limitation of data gathering to 1 year hampers back-testing the effectiveness of the buy-sell system. The documentation does not include any meaningful records for substantiation of the methodology. One statement in the documentation—"Liberal use of stop-loss orders will dramatically improve overall portfolio gains"—holds true for any system. Compared to competing software, *The Brandon Stock System* has limited appeal.

—Alan R. Shaw

PC MAGAZINE FACT FILE



***The Profit Optimizer*, Version 1.B**
MicroVest
P.O. Box 272; Macomb, IL 61455; (309) 837-4512
List Price: $495 **Requires:** 256K RAM, two double-sided disk drives, printer, DOS 2.0 or later.
In Short: A trading strategy development tool that offers a lot of flexibility but can be frustrating to use.

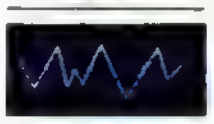
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CNTRCT/STK . CSH 86 T. BILLS    INDEX#1 . . . . . .10 DAY PRICE CHNL.
COMMISSION . 20                 SHORT AT . . . . . .0
TRADING . . BUYING AND SELLING  LONG AT  . . . . . .0
TRAILING ST.  500               INDEX#2 . . . . . .NONE
ONE INDEX  . EITHER SIGNAL      SHORT AT . . . . . .0
RE-ENTER . . REVERSE SIGNAL     LONG AT  . . . . . .0

# OF TRADES . . . . . 43   # OF LOSING TRADES . . . 26
COMMISIONS . . . . . 860  LARGEST LOSING TRADE . . .-745
LARGEST UNREAL. LOSS. . .-880  # OF WINNING TRADES. . . 17
# OF DAYS IN MARKET . . . 463  LARGEST WIN. TRADE . . . 1630
TOTAL PROFIT OR LOSS. . . 1249  AVG. DAILY GAIN/LOSS . . . 2.678
```

The Profit Optimizer *will produce this report from a trading simulation.*

THE PROFIT OPTIMIZER



The Profit Optimizer from MicroVest is a research tool for developing mechanical trading rules, hopefully profitable ones. It does not do chart-based technical analysis.

A mechanical trading system is a set of rules for buying or selling a stock that is 100 percent objective, requiring no judgment nor chart-pattern interpretation by the trader, a short-term investor. The trading rules must, therefore, be so well defined that they can be described mathematically and programmed into a computer. Considerable debate rages over the overall performance of mechanical trading systems. The proponents point out that it is the emotion-driven human element that causes unprofitable trading, which a mechanical system can eliminate. Others argue that trading is an art, not a science, and that the decision-making process cannot be "programmed."

SIMULATED TRADING If you believe the mechanical approach has merit, then *The Profit Optimizer* may fit your needs. Basically, the program simulates trading. To do so, it reads files of historical price data and performs calculations on that price data using selected indicators, which are equations that describe a trading rule. It then "buys" and "sells" securities according to these rules and keeps track of profits and losses, producing a variety of reports.

The Profit Optimizer can read price data in the Compu Trac or Commodity Systems Inc. formats. Unfortunately, the manual does not tell you the maximum number of days (or weeks) you can use to run the sim-

ulations. In addition, the package gives you no way to select a specific period of time to run the simulation.

You can specify trading rules from an extensive list of 22 technical indicators, including such popular ones as moving averages, Wilder's Relative Strength Index, accumulation/distribution, and directional movement index. All of these technical indicators use one or more parameters, with one of the parameters usually being a time period. *The Profit Optimizer* lets you set up a series of simulations with varying parameters in one run; you use this powerful feature to find the most profitable parameter setting. For example, the author of Wilder's Relative Strength Index, a popular oscillator that measures overbought or oversold conditions in a market, suggests that you use a 14-day period as your parameter. With *The Profit Optimizer*, you could automatically test periods from, say, 4 days to 20 days in 2-day increments or some other interval in order to determine whether, in fact, you should look at different time periods to optimize profits in different markets.

■ The Profit Optimizer could be a very valuable tool, but it needs more polishing.

Although the program has the ability to combine two indicators, it can join them only in an "and" or "or" relation. For example, you could specify "Enter long if Relative Strength Index is greater than 30 and the directional movement index is greater than 20."

While *The Profit Optimizer* offers a rich set of indicators, it doesn't let you define how these should be used in a trading rule. You can specify an entry or exit—buy or sell—signal when an indicator is above or below a specified level. For example, you can define a rule as "Enter long when the RSI reaches 30." But you can't specify the direction from which it should be hitting 30. In fact, most of these indicators are designed to give a buy or sell signal not when they first enter an overbought or oversold condition but as they emerge from it.

MONEY MANAGEMENT A strong *Profit Optimizer* feature is that it allows you to specify some fairly extensive money management rules. Many good traders believe that money management is more critical than the trading system itself. Money management techniques work in conjunction with trading rules to limit risk and maximize profits. For example, *The Profit Optimizer* lets you define entry stops, prof-

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* Results of *PC World's* "World Class PC Contest" for 1984 and 1985

it objectives, and stop-loss points (including trailing stops); these techniques allow you to cut your losses by automatically putting in an order to buy or sell your stock when it reaches a prespecified price level.

The Profit Optimizer can create a full range of printed reports. You can select a detailed report showing the status of the simulation on each trading day. The most summary report shows only the profit-and-loss results of a simulation, particularly useful for automatically varying parameters, since a detailed report of all of the different simulations could create an enormous amount of output.

You also have the option of printing a "profit distribution," a histogram of the profit from each set of parameters in an optimization run. If your trading rule is a good one, the profit distribution should look like a standard statistical bell graph with points leading up at a nice steady slope to the point of optimal profit, using the optimal parameters, then falling again as the parameters retreat from the mark.

NOT QUITE OPTIMUM *The Profit Optimizer* could be a very valuable tool for trading system development, but it needs more polishing. The input screens, for example, are confusing. Although messages do appear on the screen, you must refer to the manual to determine what they mean. In addition, when you set up a trading simulation, there's no escaping from mistakes; you must complete the entire specification process and print out the reports. The report formats are confusing and poorly laid out. Also, you can't tell what condition caused the entry or exit of a position (was it the signal, stop, or profit objective?).

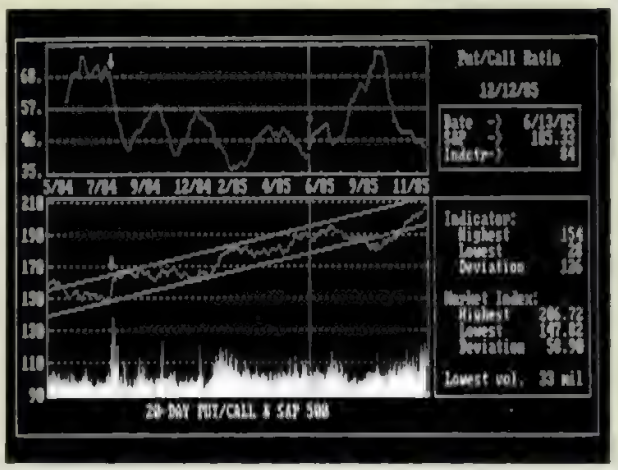
If you would like charting along with your mechanical research, MicroVest has recently introduced a separate charting program called *High-Tech* (reviewed in this issue) that includes many of the technical indicators of *The Profit Optimizer*. Together they offer the trader a powerful way of developing strategies that can then be monitored to make ongoing trading decisions.

As a trading strategy development tool, *The Profit Optimizer* covers a wide variety of technical indicators and money management techniques. However, using the program can be time consuming and somewhat frustrating.—**Alan R. Shaw**

PC MAGAZINE FACT FILE

***The Technician*, Version 3.0**
Computer Asset Management
P.O. Box 26743; Salt Lake City, UT 84126; (800) 882-3040 (801) 964-0391
List Price: $395
Requires: 192K RAM, two double-sided disk drives, color graphics card, DOS 2.0 or later.
In Short: Extremely easy to use. Offers a wide variety of indicators; the manual has a large section devoted to explaining and interpreting indicators.
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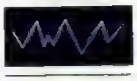




Using the pointer, you can find precise data points for close examination.

★ EDITOR'S CHOICE

THE TECHNICIAN



If you want to analyze and follow a wide variety of up-to-date, generally accepted technical indicators on the general stock market with one extremely easy-to-use, menu-driven package, you'll like Computer Asset Management's *The Technician*. (For analysis of individual securities, CAM offers a separate package, *MetaStock*.)

The program offers more than 50 general market indicators covering the big three areas: sentiment, momentum (price, breadth, and volume), and monetary (or, more correctly, interest-rate change indicators). In addition, it offers composite indicators of these three areas, and it allows you to design your own composites and as many as 20 of your own indicators. Moreover, it allows you to manipulate 27 given data entries in standard and creative ways that you specify.

The package includes 3 to 7 years of historical data at no extra cost: For January 1979 to date, the following data is supplied: advances, declines, new highs, new lows, volume of advancing stocks, volume of declining stocks, New York Stock Exchange Composite Index, total buy/sell, total shorts, public shorts, Fed Funds rate, prime rate, and U.S. Treasury bill yields (both 13 and 26 week). In addition, it supplies for December 1982 to date: the "OEX" Standard & Poor's 100 Index, New York Futures Exchange futures contract, S&P 500, Dow Jones industrial average, Value Line, NYSE odd-lot purchase, sales, shorts, large block trades, and Chicago Board Options Exchange call and put volume. You'll probably agree that the extensive historical data alone is worth the $395 price of the package.

AUTOMATIC DATA UPDATES The data can be updated manually from newspapers in a few minutes a day. Or Computer Asset Management will let your computer call up its computer in Salt Lake City. This clean data is available daily by 6:30 p.m., eastern time, and it takes only a minute to collect 20 days' worth. For the fee of $10 a month, this automated data

collection service seems quite worthwhile for its convenience and accuracy.

In addition to the 27 given data items, *The Technician* allows you to manually add to the database up to 10 variables you create, such as the prices of a few favorite stocks, mutual funds, commodities, money supply, free reserves, and so on.

The Technician's Graphic Charting menu option allows you to chart and manipulate this data in many ways. All kinds of rates of change, moving averages (simple and exponential), oscillators, spreads, trend lines, channels, least-squares trend lines, Relative Strength Index, modified stochastics, cumulative breadth and volume, on-balance volume, and relative-strength lines can be quickly computed and graphed. You can even add your own favorite formulas to this extensive list.

The menu offers a choice of time periods to plot and analyze, including 102 days, 205 days, 415 days, user-specified daily periods somewhere in between, 192 weeks, 205 weeks, 415 weeks, or user-specified weekly periods in between. Time is marked off on the horizontal axis monthly or yearly, and specific dates can be pinpointed with the aid of a moving pointer controlled by the cursor keys. This way, you can easily locate key dates and precise levels of indicators and market price indexes, allowing you to measure and judge the performance of the indicator.

Visually, the screen is divided into two halves, with the chosen indicator on the top and your favorite general stock market price index on the bottom. You can change the vertical scale of the top (indicator) chart to suit your taste. The lower (market price index) scale can't be changed, but you should find that limitation only a minor inconvenience. In a single keystroke, you can delete the lower (price index) chart and "zoom" in to fill the screen with the indicator chart alone in order to see greater detail. Graphics are in high resolution. With the help of the pointer, you can find precise data points for close examination. Also, numerical data can be printed.

GETTING A FAST START *The Technician*'s 144-page manual is excellent: clear and very well written. The 6-page "Getting Started" section should have you running indicator studies in less than an hour. Nearly two-thirds of the manual is devoted to explanation and interpretation of the indicators. The appendix suggests four additional books for those who would like more. Of course, complete novices will need to spend quite some time to become proficient in indicator interpretation, but this program should significantly speed and enhance their education. Apart from indicator interpretation, the software is extremely easy to use and requires no previous computer experience.

One drawback to *The Technician* is that

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Bringing you the future.
Princeton continues to set the industry pace with products like our HX-12E, the first IBM-compatible high resolution RGB color monitor with a .28mm dot pitch to support IBM's Enhanced Graphics Adapter. And our SR-12P, the first IBM-compatible analog color monitor, with a .26mm dot pitch to support IBM's Professional Graphics Controller...

Princeton's HX-12E gives you brilliant 64-color displays and extra sharp text.



it limits you to only one modem-accessible database sold by the vendor. It is general market data only; you can't access data for individual stocks. Thus, the program trades flexibility and all inclusiveness for ease of use.

You'll like *The Technician* if you enjoy taking a general market overview. Compared with other technical analysis programs, it is extremely easy to start up, operate, and update. It runs quickly, efficiently, and without errors. In several weeks of testing, I did not receive a single error message or undergo a program crash. And it gives you 3 to 7 years of back data to experiment and gain experience with. I recommend it.—**Robert W. Colby**

TRENDLINE II



Written in FORTH, *Trendline II* is dazzlingly fast. However, Standard & Poor's recent entry into the technical analysis software market is otherwise fairly standard. It gives you a good range of basic technical analysis functions and is easy to use but offers few distinctive features.

Installation is extremely easy for single or dual floppy disk drive configurations. Although we tested a prerelease version of the package that could not be configured for a hard disk, the final product will include this capability. Once you have installed the package, you just boot the disk by turning your computer on or by pressing the Ctrl-Alt-Del keys; then you're at the main menu.

A sample data disk gives you a good deal of data to experiment with: 1 year of daily trading data on 50 important stocks, 5 years of weekly data on another 25 stocks, and 10 years of monthly data on yet another 25 stocks. In addition, this sample data disk contains similar daily, weekly, and monthly histories for the Standard & Poor's 500 Index and daily only histories for the Dow Jones industrials, transports, utilities, and the New York Stock Exchange Composite Index.

You can easily and automatically update all these files by modem, or you can delete some and add others. In addition to the sample, you can create and update your own new data disks. The program disk includes the necessary software to automatically dial up and log on to the Warner Computer Systems on-line database through Telenet.

Trendline II loads data and produces charts faster than any program we've seen thanks to its having been written in the FORTH programming language.

■ Trendline II loads data and produces charts faster than any program we've seen.

The package produces charts on-screen in monochrome only. You can display a maximum of 255 periods (days, weeks, or months) on the screen or printer at one time. Then you can effectively expand this number by zooming in to examine 128, 64, or 32 periods more closely, then zooming back out again if you wish. You can choose either arithmetic or semilogarithmic scaling, and you can change the scale.

You can move your cursor to a coordinate on your chart and the program will give you a readout of the date, high, low, close, and volume. However, the program will not do the same for an oscillator or a volume indicator. Since the axes of the charts are unlabeled, you will have to guess the coordinates of these studies. If your investment methodology includes back testing of strategies, that is, looking at how well they would have predicted past price changes, the program's inability to pinpoint the coordinates of your studies is a significant drawback. Back testing requires you to clearly see the buy or sell signals so you can accurately judge how well you would have done using a particular strategy.

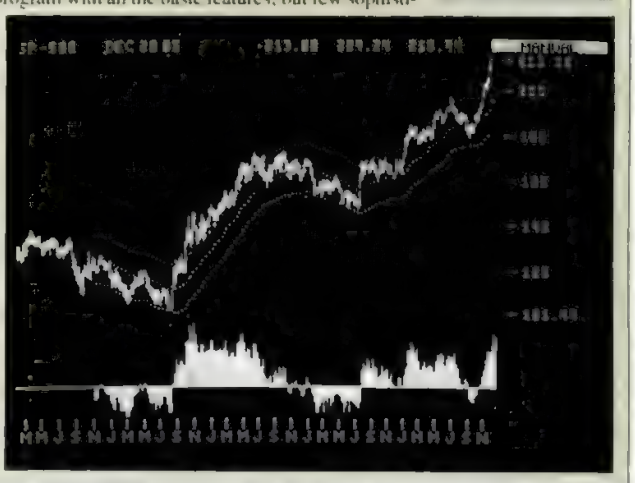
Overall, the on-screen graphics quality charts are too small to read comfortably and should be larger.

INDICATORS The package offers a rather limited menu of graphic tools, including simple, weighted, and exponential

PC FACT FILE

Trendline II
Standard & Poor's Corp., Micro Services Div.
25 Broadway; New York, NY 10004; (212) 208-8000
List Price: $275 **Requires:** 128K RAM, one double-sided disk drive, color/graphics card
In Short: An easy-to-use program with all the basic features, but few sophisticated features

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Trendline II *produces charts in monochrome only, with either arithmetic or semilogarithmic scaling.*

moving averages with percentage bands (or envelopes) around them; oscillators (the difference between two moving averages); and trend, parallel, vertical, and horizontal lines. One interesting feature lets you erase and then restore lines.

You can easily create relative price/performance charts. You choose a volume histogram and five volume indicators, including on-balance volume (OBV), positive and negative volume, percentage price change times volume, and "daily volume" (comparing the close to the low and high, then multiplying by volume).

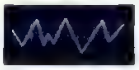
Although this menu is limited, you can create and save custom formulas using the volume indicators and the following functions: addition, subtraction, multiplication, division, and computation of moving averages. In addition, *Trendline II* offers an autorun mode to speed routine analysis.

The brief 26-page user manual is clearly written but leaves room for future fleshing out with examples and interpretations. The final version of the manual will include an index, table of contents, an explanation of error messages, and discussion of all the commands. In addition, it will include an appendix discussing moving averages, oscillators, and volume indicators and will provide a bibliography.

GLITCHES I encountered a few minor problems with the system. For example, when I mistakenly configured the program for the Epson FX-100, rather than my Epson MX-100, the program hung so thoroughly that I had to reboot the system. In addition, the error messages could be more precise. For example, when I tried to call up the on-line database, an error message told me that my phone line was busy when, in fact, the phone jack was disconnected.

In sum, *Trendline II* is a relatively simple program that runs fast and is easy to use. It seems appropriate for those with a modest desire to perform fairly basic technical analysis. For $275, however, you could do better.—**Robert W. Colby**

WALL STREET WINDOW



Pinstripe Software touts *Wall Street Window* as a technical analysis package for stocks that brokers can also use as a sales tool—though individual investors can use it as well.

When it comes to technical indicators and studies, *Wall Street Window* offers nothing special. It graphs daily, weekly, and monthly charts. You can chart 1 year of daily quotes, 5 years of weekly, and 21 years of monthly data in high-resolution color graphics. Simple, weighted, and ex-

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years of monthly data in high-resolution color graphics. Simple, weighted, and exponential moving averages are available, as well as oscillator studies. Technical indicators include on-balance volume, price volume, positive and negative volume, and daily volume.

Wall Street Window also performs trend line analysis. The trend lines are not drawn as lines but as a series of cross hairs, which are difficult to read. You can display standard trend lines or use trading bands that encase price fluctuations within parallel lines placed at a specified percentage above and below price charts.

The package also offers profit/loss and dollar comparison analysis. The former could be considered data for fundamental analysis. The latter compares the relative performance of five stocks. Neither of these features has much to do with the technical aspects of analysis.

FOUR-COLOR GRAPHICS When Pinstripe calls *Wall Street Window* a sales tool, they point to the package's high-resolution color graphics capabilities. Using an ordinary color graphics card, you can get two-color graphics. To get four-color graphics, you must purchase a special graphics adapter, such as AST's ColorGraphPlus either from Pinstripe or direct from AST. While the package contains some nice charting features, the implementation could have been better.

Scales on the charts are either arithmetic or semilog. While the scales on the date axis are quite detailed and easy to read, those on the *y* axis (which is usually used for price or indicator levels) are inadequate because they're not detailed enough.

The index point function is helpful but, once again, not helpful enough. You can use it to read out the exact coordinates for a given point on a high-low-close bar chart or a graph of volume. But this function does not display coordinates for moving averages or display indicator levels. And because indicators are superimposed over the price data, charts of the screen and printouts are extremely difficult to read.

While the package offers a window function that acts as a zoom, allowing you to view whatever amount of data is desired, it does not offer a split-screen function that would enable you to, for example, view a high-low-close bar chart and an indicator chart at the same time. The key-saver function is a utility program that automates the system.

You can retrieve current and historical data from three sources: Dow Jones News/Retrieval, Warner Computer Systems, or Lotus's Signal. Once you configure the system, collecting data is easy. Either a 300- or 1200-baud rate is supported. In addition, you must call Pinstripe Software for a password check number, which is the vendor's method of copy protection. While you can make as many backup copies as you want, only those who are registered can use the package's communications capabilities.

You can also manually input data using the editing price file command, which also allows you to correct, delete, adjust for stock splits, or print price and volume information. A DIF file option lets you transport your files to a spreadsheet.

TRYING TO SERVE TWO MARKETS *Wall Street Window* is relatively easy to use, but the manual is frustrating because it is not as detailed or accurate as it should be. The manual, for example, lists relative strength as a study in the program, when it really meant momentum analysis. In addition, the index is vague, with many terms missing. However, product support, available during normal business hours and Saturday, 9 a.m. to 12 p.m., is thorough and professional.

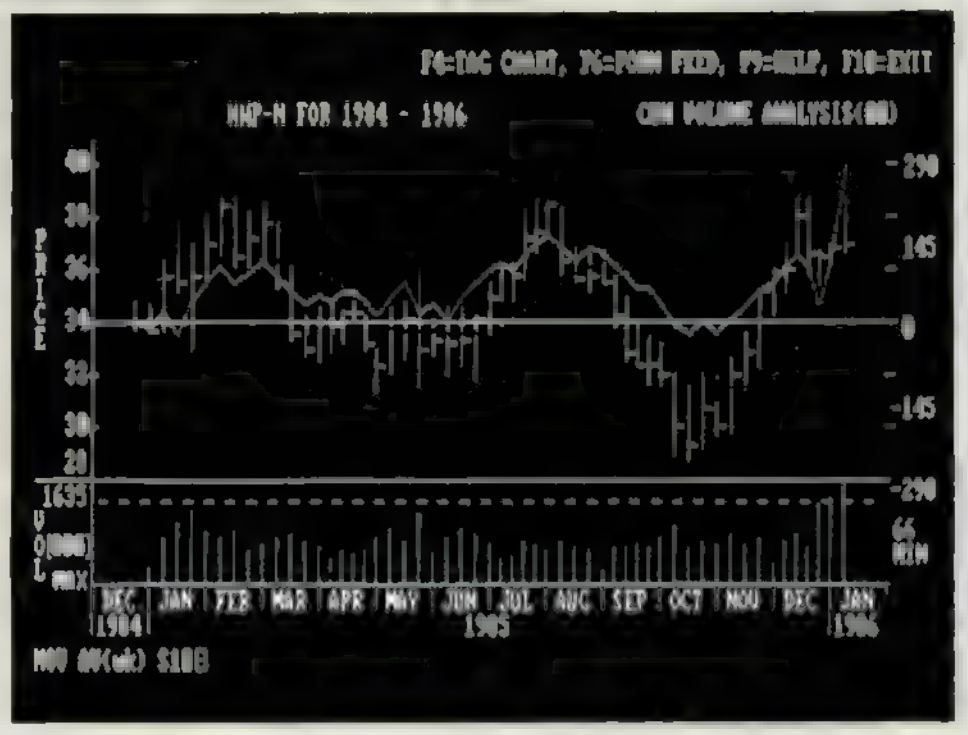
It seems that *Wall Street Window* is attempting to please two markets, but its technical analysis capabilities are inadequate for both sales brokers and individual investors. Although it is possible to successfully direct a package to both markets, *Wall Street Window*, by just scratching the surface, has not satisfied either potential user.—**Ronald F. Daino**

PC MAGAZINE FACT FILE

Wall Street Window
Pinstripe Software Ltd.
8260 Greensboro Dr., #137; McLean, VA 22102; (703) 790-8488
List Price: $395
Requires: 192K RAM, two double-sided disk drives, color graphics card, color monitor or composite monochrome monitor, DOS 2.0 or later
In Short: Targeted to both technical analysts and brokers, the package is too superficial to satisfy either.

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While scales on the date axis are clear, those on the y-axis are not detailed enough.

WINNING ON WALL STREET



Winning on Wall Street from Summa Technologies Inc. is easily the most heavily hyped financial program on the market. The advertisements for it claim it is the "most powerful tool" and the "recognized leader in the field" and say that users have been making "more money

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SR-12P. Top-of-the-line analog color monitor features ultra high resolution (640 x 480). 4,096 colors for superb graphics. The finest dot pitch (.26mm) of any PGC-compatible monitor. Laminated nonglare panel.



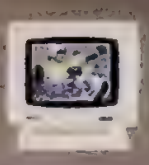
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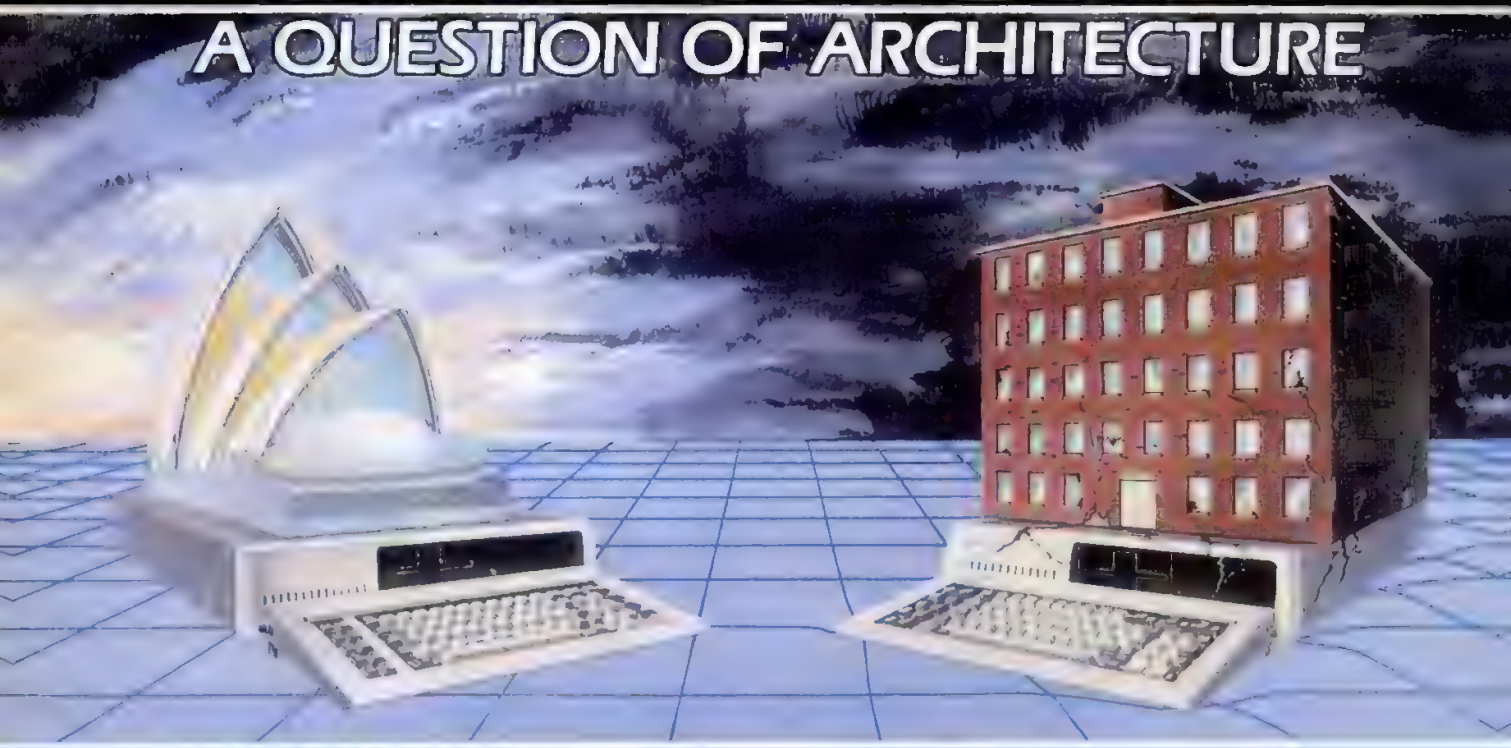
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QNX vs UNIX

A QUESTION OF ARCHITECTURE



What do QNX and UNIX have to do with architectural design?

The design determines the environment in which you and your applications must survive. If the shear weight of the UNIX operating system brings the PC to its knees, all applications running under it will suffer. Unix was conceived more than a decade and a half ago and the product today is the result of modifications, additions and patches by hundreds of programmers. The result is a large and convoluted piece of software which needs the resources of an AT or more.

QNX's superb performance and compact size is the result of one dedicated design team with a common purpose, and complete understanding of both the software and the environment in which it must run. It runs quickly and efficiently on PC's and soars on an AT. Unlike Unix, QNX is capable of real time performance and is the undisputed choice for real time process control, and office systems. You can buy an OS that offers you a 1 to 3 user dead end on an AT, OR, you can consider QNX which allows you anywhere from 1 to 10 users on both PC's and AT's. And we don't stop there. Unlike other Unix-type systems for PC's, QNX is also a networked operating system. Not a patch-on network, but a fully integrated networking system for up to 255 micros. QNX allows you to start with a single machine and grow if and as required. There are no dedicated file servers and you can attach terminals (users) to any machine. To choose a solution which ignores networking, is closing the door on your future.

Everyone is talking about Unix like systems, but no one wants to abandon the tremendous amount of DOS software available. QNX does not force you to make that decision. You can run either PC DOS 2.1 or 3.1™ as one of QNX's many tasks. (DOS File compatibility and DOS development tools are also available). Don't misunderstand us. We at Quantum have a great deal of respect for Unix. It was a major force in moving operating systems out of the 1960's and into the 70's. QNX however, was designed in the 80's and will be a driving force of the 1990's. **Over 20,000 systems have been sold since 1982.**

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• **MULTI-TASKING:**	**–40 tasks per PC, AT.**
• **NETWORKING:**	**–255 machines. –up to 10,000 tasks and 2000 users/network. –2.5 Megabit token ring.**
• **REAL TIME:**	**–2800 task switches/sec (AT).**
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• **Support:**	**–Online update system allows downloading of new releases over the phone. –Technical support hot line.**
• **COST:**	**–From US $450 –Call for runtime prices.**
• **HARDWARE SUPPORT:**	**–IBM PC, XT, AT™ (both real & protected) and compatibles.**

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CIRCLE 391 ON READER SERVICE CARD

in the stock market than they dreamed possible.'' All the promotion aside, *Winning on Wall Street* is a fairly decent package, though it may not be worth its $695 price.

Winning on Wall Street is divided into three programs, which can be purchased separately (they are not promoted that way): Data Manager accesses pricing data from on-line databases and allows you to plot simple price and volume charts; Trader's Forecaster includes technical indicators and all of the package's sophisticated charting capabilities; and the Traders Accounting module keeps records of transactions, profits, and losses, using current market prices when the database is updated. The accounting module can handle 999 accounts and generate a variety of reports such as cash and liquid funds, transactions, realized and unrealized profit and loss, and tax data.

The package also includes a built-in autorun routine that can automatically perform a series of studies and plot indicators for as many securities as your disk can hold.

ON-LINE EXPANSION When it was first introduced, *Winning on Wall Street* could access only the Dow Jones News/Retrieval service. Now, you can also access Remote Computing's Dial Data, which offers stock data back to 1970, options data to 1973, commodities to 1965, and data on market indexes such as the Standard & Poor's 500, the New York Stock Exchange Composite Index, and Value Line. Creating files and collecting data by modem are easy. You can also enter data manually. The program allows you to edit files, adjust for stock splits, and convert daily price and volume data into weekly and monthly data.

Winning on Wall Street's graphics are not the best. The package is limited to 190 high-low-close price bars for either days, weeks, or months. When plotting daily charts, 190 bars add up to only 9 months' worth of data, a shorter perspective than most commercial short-term charting services offer. In contrast, some of the newer packages allow you to chart up to 1,000 days' worth of stock prices. Another limitation is that you can scale the vertical axis of your charts arithmetically only (not semi-log). Moreover, the package offers limited ability to adjust scales, and no zoom feature to help you examine charts in greater detail.

■ On the whole, Winning on Wall Street does not live up to its inflated advertising claims (what could?).

The package does offer a good selection of popular indicators such as moving averages and trading bands, least-squares fit lines with standard deviation channels (called ''midchannel support resistance lines''), ⅓ and ⅔ speed resistance lines, volume indicators (such as net positive, negative, close versus midpoint, percentage change times volume, and on-balance volume), relative price performance between securities and indexes, and user-specified rates of change. Moreover, you can plot point and figure charts and design and save your own indicator formulas.

WINNING WITH STRATEGY ANALYSIS One of the highly touted features of the Trader's Forecaster module is its Strategy Analysis command, which is supposed to automatically determine the optimum trading strategy for a selected security based on the closing price crossing a simple, weighted, or exponential moving average. The idea is to ''retrofit'' one of a possible 297 different moving averages to past data on the controversial assumption that future patterns will significantly resemble past patterns. The hope is that past ''optimum'' parameters will achieve better future results than randomly selected ones. The program realistically allows you to specify a percentage for trading cost or brokerage fees.

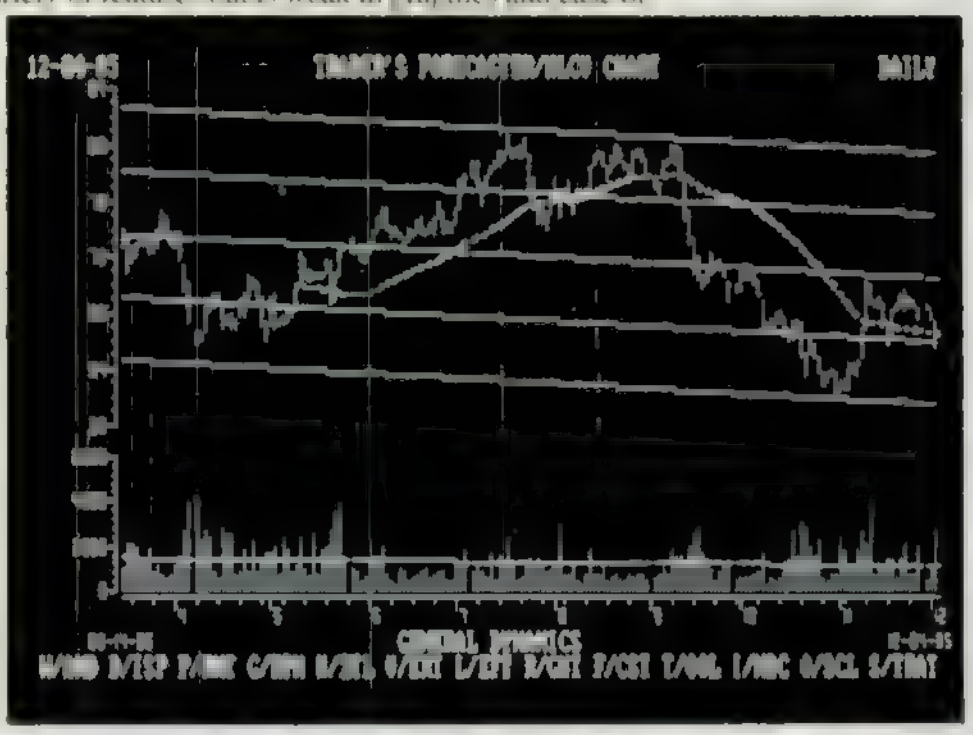
The example of this trading rule given in the manual shows a 35-day simple moving-average crossover rule—when the daily closing price comes from below and crosses above the moving-average line, you buy; then, when the closing-price line graph falls back below the moving-average line, you sell and go short—applied to

PC MAGAZINE FACT FILE

***Winning on Wall Street*, Version 1.02**
Summa Technologies Inc
P.O. Box 2046, Beaverton, OR 97075, (503) 644-3212 (in Ore.), (800) 792-2211
List Price: $695 **Requires:** 192K RAM, two double-sided disk drives, color graphics card, DOS 1.1 or later
In Short: Offers a wide variety of features but is weak in graphics and ease of use

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The least-squares-fit lines shown here are one example of this package's popular indicators.

TECHNICAL ANALYSIS

SUMMARY OF FEATURES

Product	Price	Data entry	Database accessed	Display	Charting features: Time frequency plotted: Daily	Weekly	Monthly	Quarterly	Yearly	Maximum number of data points	User-defined time periods	Grid lines: Horizontal	Vertical	Customized formulas	Number of graphs per screen	Studies plotted: High-low-close bar	Volume histograms	Trend lines	Trading bands	Oscillators	Support/resistance lines	Relative strength
Advanced Chartist	$495.00	Manual or by modem	CS, CSI, DJN/R, IDC, RC, TS, WCS	Color	■	■	■	■	■	240	■	■	■	■	8	■	■	■	■	■	■	■
Chart Trader Plus	$299.95	Manual or by modem	CSI, NCN	Both	■	■	■			280	■		■		2	■	■	■	■	■	■	■
Compu-Cast	$325.00	Manual or by modem	CS, DJN/R	Both	■					78	■				1							
Compu Trac	$1,900.00	Manual or by modem	CS, CSI, DJN/R, IDC, IPS, NCN, RC, WCS	Both	■	■	■	■	■	171	■	■	■	■	2	■	■	■	■	■	■	■
Dow Jones Market Analyzer	$349.00	Manual or by modem	DJN/R	Both	■					228					1	■	■	■	■	■	■	■
Dow Jones Market Analyzer PLUS	$449.00	Manual or by modem	DJN/R	Both	■	■				520	■	■	■	■	4	■	■	■	■	■	■	■
Ganntrader I	$549.00	Manual or by modem	CSI	N/A	■	■	■			300	■	■	■		1	■					■	
High-Tech	$495.00	Manual or by modem	CSI	Both	■					106		■			4	■	■	■	■	■	■	■
Market Counselor	$189.00	Manual only	N/A	Mono-chrome	■					60					2		■			■		
MetaStock	$195.00	Manual or by modem	CS, CSI, DJN/R, IDC, IPS, NCN, RC, WCS	Color	■	■	■	■	■	1,000	■	■	■		36	■	■	■	■	■	■	■
N² Market Analyzer-XL	$395.00	Manual or by modem	CS, CSI, DJN/R, WCS	Both	■	■	■	■	■	480	■		■	■	2	■	■	■	■	■	■	■
N² Stock & Futures Analyzer-XL	$395.00	Manual or by modem	CS, CSI, DJN/R, WCS	Both	■	■	■	■	■	560	■		■	■	2	■	■	■	■	■	■	
One Minute Market Analyst	$195.00	Manual or by modem	DCS	Both	■	■				480	■				1		■			■		■
Quickplot	Free with CSI purchase	Manual or by modem	CSI	Color	■	■	■			254	■		■		5	■	■	■		■	■	■
Relevance III	$650.00	Manual or by modem	CSI, Q	Both	■	■	■			240					3	■	■					
STOX/C	$79.99	Manual or by modem	CSI, WCS	Mono-chrome	■					120	■				1	■				■		
Swing Trader	$1,440.00	Manual or by modem	CS, CSI, DJN/R, IDC, RC, TS, WCS	Color	■	■	■	■	■	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Technical Indicator Program	$89.50	Manual only	N/A	Mono-chrome	■					260	■	■			1					■		
Telescan Analyzer	$49.95	Manual or by modem	TS	Both	■	■	■			*				■	2	■	■	■		■		■
The Brendon Stock System	$325.00	Manual or by modem	DJN/R	Both	■	■				90	■	■	■		1	■	■	■				■
The Profit Optimizer	$495.00	Manual or by modem	CSI	N/A	N/A	N/A	N/A	N/A	N/A	†	N/A	N/A	N/A		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
The Technician	$395.00	Manual or by modem	CAM	Both	■	■				410	■	■	■	■	2	■	■	■		■	■	■
Trendline II	$275.00	Manual or by modem	WCS	Mono-chrome	■	■	■			255	■			■	8	■	■	■	■	■	■	■
Wall Street Window	$395.00	Manual or by modem	DJN/R, WCS	Both	■	■	■			260	■	■	■			■	■	■		■		■
Winning on Wall Street	$695.00	Manual or by modem	DJN/R, MD/DS, RC	Mono-chrome	■	■	■			190		■	■	■	2	■	■	■	■	■	■	■

Abbreviations: CAM—Computer Asset Management, CS—CompuServe, CSI—Commodity Systems Inc., DCS—Desco Computer Services, DJN/R—Dow Jones News/Retrieval, IDC—Interactive Data Cor
NCN—National Computer Network, Q—Qtrieve, RC—Remote Computing, TD—Telescan Database, TS—The Source, WCS—Warner Computer Systems. N/A—Not applicable. *13 years' worth of d

	Moving averages						Overall market indicators				
	Cycles	Point and figure charts	Simple	Weighted	Exponential	Other	Momentum	Sentiment	Monetary	Indicator values printed	Autorun feature
	■	■	■	■	■	■	■		■	■	■
	■		■				■		■		
									■	■	
	■	■	■	■	■		■	■	■	■	■
			■	■	■		■		■	■	■
		■	■	■	■		■		■	■	■
	■					■	■		■		
	■		■	■	■		■			■	■
			■				■	■		■	■
	■		■	■	■		■		■	■	
			■		■		■	■	■	■	
		■	■		■		■		■	■	
			■				■		■	■	■
			■	■	■	■		■	■	■	
	■		■			■					■
		■			■	■	■		■	■	
	N/A	N/A	N/A	N/A	N/A	N/A	■		■	■	
						■	■			■	■
	■		■		■		■	■	■	■	■
			■	■			■		■	■	■
	N/A	N/A	N/A	N/A	N/A	N/A	■		■	■	
	■		■		■	■	■	■	■	■	
			■	■	■		■		■	■	■
			■	■	■		■		■	■	■
		■	■	■	■			■	■		■

IPS—I.P. Sharp Associates, MD/DS—Merlin Dial/Data Service, †Unlimited, but 500 per file. ■ means yes.

General Dynamics. In 1984, this rule produced a 53 percent annualized rate of return, assuming a 1 percent trading cost.

One test of validity for any trading system is its "portability," its ability to predict consistently profitable results for various time periods. The 35-day moving-average rule for General Dynamics failed this portability test: It produced a substantial 30 percent annualized rate of loss in 1985. Similar discouraging results were obtained testing other securities with the Strategy Analysis command.

Another forecasting technique the package calls "sophisticated" and "complex" is "adaptive filtering," which is supposed to offer a "highly accurate forecasting line" but is not defined in the manual. You'll have a hard time distinguishing it from a simple moving average.

Still another touted "unique and proprietary" technique available in *Winning on Wall Street* is the "matrix projection formula." You are asked to accept on faith (something seasoned analysts don't like to do) a totally undefined "black box" that sets price objectives and predicts the next price high and low using some secret formula "similar to a trading channel."

One of the most irritating features of the package is the manual—427 repetitious pages. It starts with 36 pages of "important note: addenda, corrections, and updates." The vendor, however, does plan to reprint the manual when the program is revised, sometime in the spring of 1986. The manual is at least fairly complete; it includes examples, error messages, a glossary, a table of contents, and an index.

One caution: Beware that on the Set Communications configuration, the cursor is one space off the entry line; you must backspace one space before you can make any changes. Also, the disks are copy protected, and hard disk users must keep their program disks in the A: drive.

On the whole, *Winning on Wall Street* does not live up to its inflated advertising claims (what could?), but it does offer a lot of features. It is not the easiest package to use, nor does it have the best and most flexible graphics—in fact, it's below standard on both counts. But if you don't mind putting up with these annoyances and can pick it up on sale, you might be fairly served.—**Robert W. Colby**

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Investment Software

FUNDAMENTAL ANALYSIS



Excessive research time has always been the main drawback to fundamental analysis. Dean Witter Reynolds analysts review fundamental analysis programs that help you sift through stock data to pick the best "bargains."

Recently, General Electric announced plans to take over RCA. At the same time, GE declared that, upon completion of the deal, it would pay RCA stockholders $66.50 per share. During the week the takeover was announced, RCA's stock shot up from $47.25 to $59.63 per share—a staggering 26 percent gain.

Nearly every time you pick up a newspaper, you read about yet another takeover, with the stockholders of the target company reaping huge profits overnight. Takeovers occur over and over because the acquiring company thinks the target's stock price does not represent the company's real worth, in terms of its cash, assets, and earnings, making it a bargain. Many Wall Street analysts, for example, felt the real value of RCA was more than $75 per share, and this, in turn, led General Electric to believe that at even $66.50 per share RCA was a bargain. In essence, fundamental analysis is all about finding such bargains.

That doesn't mean that every time you buy a stock that seems undervalued another company is going to snap it up at a higher price. But it does mean that if the stock is undervalued, odds are that the price will rise, and you'll be able to sell the stock for more than you paid for it.

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One of the allures of the fundamental approach for the individual investor is that it examines familiar factors. For example, as an investor you might be concerned that a company has new management or has introduced a new product line. Or you might look for stocks listed on the New York Stock Exchange with stock prices less than their book value per share. While there are no magic formulas, fundamental analysis helps you look for stocks that meet criteria you think indicate a bargain.

The data required for fundamental analysis is easy enough to find. Just look in annual reports, newspapers, investment services, and other sources of printed information. But, as you can imagine, it isn't easy to sift through all this information to find the small subgroup of stocks that meet your particular criteria.

FINDING THE WINNERS The time required to research stocks has long been recognized as a major limitation of fundamental analysis. Recently, however, software for the PC has eliminated that time constraint, giving both individual and professional investors access to huge databases with data on thousands of companies and their stocks. The PC can manipulate this data quickly and identify stocks that meet your criteria in minutes.

PC Magazine asked a team of experts from Dean Witter Reynolds Inc. to evaluate seven software packages for funda-

OUR TEAM AT DEAN WITTER REYNOLDS

***Rosemary Gitto** is a full-time consultant for Dean Witter Reynolds. She recommends hardware and software to the firm's account executives and provides them with technical assistance.*

***Sharon Rosenberg** is manager of microcomputer systems support for Dean Witter Reynolds. She is responsible for recommending hardware and software to the company's account executives. In addition, she edits the firm's* Personal Computer Newsletter.

mental analysis. These packages are useful for anyone who uses a fundamental approach, be they professional account executives or individual investors. However, these two groups have slightly different needs. As our reviewers evaluated the packages, they identified ones that might best suit these two types of investors.

If you're a broker or an account executive, for example, you need a powerful, flexible, and sophisticated package for finding stocks that meet all sorts of criteria. But you're probably overworked and don't have time to waste using an unwieldy software package. Therefore, the package should be easy to learn and use and take as little time as possible for data entry.

The needs of an individual investor differ from those of a professional. While the cost of the package is a more important factor, an individual investor would be more willing to spend time using a package, especially if it teaches fundamental analysis. *The Evaluation Form* reviewed in this issue, for example, provides a proven fundamental analysis technique plus a good explanation of fundamental analysis terms, although its data entry process is relatively tedious. Like the professional, however, the individual investor wants a powerful and flexible package that can screen a large database of stocks.

PC MAGAZINE EDITOR'S CHOICE

***Stockpak-II** from Standard & Poor's Corp. and **Value/Screen Plus** from Value Line Inc. are competent and comparable stock-screening packages. Both packages are very easy to use, and both access extensive databases containing information on more than 1,500 companies. In addition, both offer good reporting capabilities. While* Stockpak-II, *written in the FORTH combined programming language and operating system, is faster and provides more data items per company,* Value/Screen Plus *gives you a simple portfolio manager.*

When we began collecting packages for the fundamental analysis section of this special report, we were surprised at the scarcity of available packages. But it is investors' requirements that make these packages rare. To meet them, most fundamental analysis packages access an extensive database of financial information, either on a disk or an on-line database via modem. Building and maintaining such a database is a huge task, and vendors cannot justify the cost unless they can use the database for other purposes.

For that reason, companies who offer fundamental analysis software usually provide financial data in a variety of forms—on disk, on-line, or in printed form—to a variety of clients. These vendors include such well-respected names as Dow Jones & Co., Standard & Poor's Corp., and Value Line Inc.

A FUNDAMENTAL APPROACH There are two types of fundamental analysis packages. The majority, called screening packages, screen the large group of stocks in the database, identifying only those meeting the conditions you specify. But a limited number take the process a step further. These packages help you examine the handful of stocks that have met your screening criteria and determine when to buy or sell these stocks.

This determination is based on a specific fundamental approach to investing. For example, *The Evaluation Form* allows you to examine one stock at a time using a fundamental approach developed in 1951 by the National Association of Investment Clubs Inc. (NAIC) of Royal Oak, Michigan. NAIC members consistently beat the stock market averages.

FUNDAMENTAL ANALYSIS
GLOSSARY OF TERMS

Asset Anything of value that is owned by a company, including cash, inventory, land, buildings, equipment, and so forth.

Balance sheet A financial statement showing what a company owns (assets), what it owes (liabilities), and the difference (stockholders' equity).

Beta A measure of the volatility of a stock's price relative to the overall stock market.

Book value The equity value of an outstanding share of stock.

Current asset An item of value owned by a company that either is cash or is expected to be used up or converted to cash within 1 year.

Current liability Any obligation of a company that will become due within 1 year.

Current ratio A common measure of a company's liquidity, calculated by dividing current assets by current liabilites.

Current yield The annual dividend per share divided by the current market price of a stock.

Debt/equity ratio A common measure of leverage in a company's financial structure.

Dividends Payments to stockholders of a portion of the profits of a company.

Earnings per share The net earnings of a company divided by the number of outstanding shares of stock.

Fundamental analysis An analytic technique for the buying and selling of stocks based on the belief that stock prices are determined by the underlying value of a company in terms of its cash, current assets, and earnings.

Income statement A financial statement that presents a company's revenues, expenses, and earnings over a specific period of time.

Liability Anything a company owes.

Price/earnings ratio A common measure of the reasonableness of a stock's price.

Stockholders' equity The difference between total assets and total liabilities, also called "net worth."

STOCK-SCREENING PACKAGES One of the most important criteria in selecting a stock-screening package is the database it accesses. Different databases contain different universes of stocks. Using the same criteria on these databases produces different lists of stocks. You might have to decide whether you want to look at blue chip stocks on the New York Stock Exchange or stocks of smaller companies on the over-the-counter (NASDAQ) market.

How often you want updated data depends on whether you're a long- or short-term-oriented investor. If you take a long-term approach to choosing stocks, you can receive stock data from data disks, which the software vendor provides periodically. If you want data on a daily or weekly basis, you must subscribe to on-line databases, which are updated continuously.

Either way, you'll incur ongoing charges. If your package accesses data on a disk, you will have to pay an annual subscription fee. If you access an on-line database, such as Dow Jones News/Retrieval, you will have to pay time charges each time you retrieve data for screening.

The amount and type of data available for screening varies for each software package and each data source. For example, Standard & Poor's *Stockpak-II* offers you the choice of subscribing to up to four databases on disks. One database contains about 1,500 stocks listed on the New York Stock Exchange, while another offers the same number of stocks listed on the American Stock Exchange. A third provides two disks and contains a total of 2,200 over-the-counter stocks. Finally, a composite database gives data on 1,500 leading stocks listed on the New York Stock Exchange, American Stock Exchange, and the over-the-counter market.

Each *Stockpak-II* database disk has 83 predefined data items on each company, including Standard & Poor's proprietary ranking and earnings-per-share estimates.

Value Line's *Value/Screen Plus*, on the other hand, offers only one database disk. That disk contains information on more than 1,600 stocks that account for more than 90 percent of stock trading activity on all U.S. stock exchanges. The data disk also contains 37 predefined data items for each stock, including historical growth rates, measures of current performance and volatility, and key projections. In addition, Value Line's proprietary rankings for timeliness and safety are included.

Dow Jones's *Market Microscope* operates differently from *Stockpak-II* and *Value/Screen Plus*. *Market Microscope* collects data from the Dow Jones News/Retrieval service; it lets you retrieve 68 financial indicators on over 3,000 companies and 170 industries.

OTHER EVALUATION CRITERIA To help you choose the most appropriate fundamental analysis package for your needs, we examined a wide range of additional features. The number of companies and industries each package can screen, the stock exchanges on which the companies are listed, and the frequency at which data is updated, all bear directly on the ultimate list of stocks you receive from a screening. The data items available for screening pose obvious limitations. We checked whether the packages contain data about market price, earnings, sales, beta, dividends, assets, liabilities, financial ratios, and proprietary items.

But even if a database does not include every data item you'd like for screening, you can greatly expand the possibilities if the package lets you combine items for screening by using formulas. Thus, you can create a new financial ratio or constant for screening purposes. You should also be able to specify ranges and limits for each screening criteria. For example, if you are screening for stocks with low price/earnings ratios, you might enter a range of, say, greater than 0 but less than 6.

Another way to customize a package is if the package allows you to design your own reports in addition to using ones provided with the package. User-defined reports, naturally, include only items important to your particular situation.

To ensure that you can create precise screens, we reported on the maximum number of items available for screening. A minimum of five is recommended.

Our team of experts from Dean Witter Reynolds looked at these and other features as they evaluated each package. In the reviews that follow, you can see their findings and use them to determine the right package for your own needs.

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TOTAL LANDED COST, L.A. HARBOR	$473.27	$385.30

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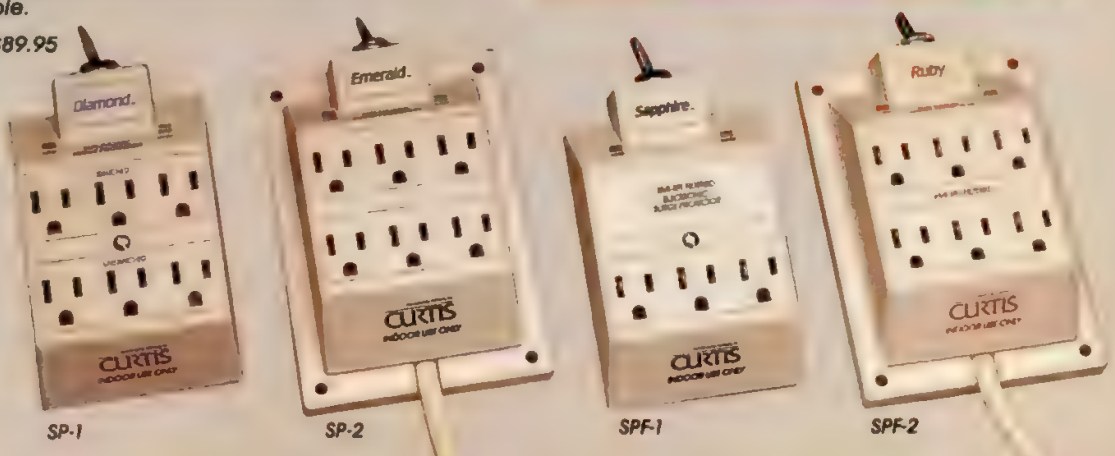


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SP-1 SP-2 SPF-1 SPF-2

COMPUSTOCK



Compustock uses fundamental stock analysis to help you screen and then choose stocks based on degree of probable risk and amount of potential return of the investment. You can enter data manually or automatically through the *Compustock* database service. The program can also access the Dow Jones News/Retrieval and the CompuServe on-line databases.

BUY, SELL, OR HOLD *Compustock* uses historic earnings, price, and dividend information along with regression analysis to compute likely future earnings and dividend growth rates. It assesses whether the current price of a stock is in what the vendor calls a buy, sell, or hold range.

Compustock includes historic price/earnings plots; you can input projected economic data to compute the probable total return on your investment under a range of conditions. Using stock beta values and other financial criteria, it helps you assess risk and measures near-term financial health from quarterly earnings data and other measures.

The package comes with a program disk and a data disk with predefined information on selected stocks. The optional *Compustock* database service supplies two disks and a booklet (either monthly or quarterly according to your subscription) with details on about 80 stocks, far too limited a number for serious analysis. The company is currently building, however, a library of approximately 1,500 to 1,800 fully analyzed stocks. The subscription rate for this optional database is $245 for a year; $90 for 3 months; or $30 for one month.

TWO ROUTINES *Compustock* has two major routines along with graphics capabilities. The first routine, Price-Earnings, allows you to use historical data to project possible future prices, earnings, dividends, and total returns. In addition, projections take into account different possible economic conditions that could affect the stock's performance.

In the second routine, Financial Analysis, you input historical data that the program will use to compute financial ratios. These ratios help you pick out trends and assess the financial status of the company you are evaluating.

GRAPHIC MODELS *Compustock* will also show you graphic models of its analyses that make it easier to discern earnings and dividend trends.

You select the graphs you want from a menu within each routine. The graph of earnings and dividend trends, for example, shows the earnings as solid vertical bars and the dividends as hollow vertical rectangles. The manual discusses what you're looking at and for in each graph so that you can easily decipher its meaning.

A TUTORIAL The *Compustock* user's manual was written as a tutorial for those with no prior stock-investing experience. The manual's step-by-step instructions lead you through the program's options—they even include a flowchart demonstrating the interrelationships between options on the main menu. The manual's straightforward installation instructions are also easy to understand.

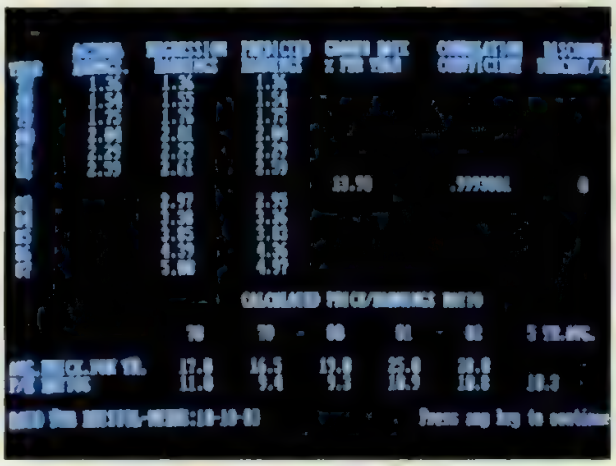
A tutorial disk accompanies the package. It can be very helpful for those who have the time to absorb the instructions.

THE LONG TERM *Compustock* is for stock analysts who are interested in long-term investments rather than for daily traders. The program looks at all the standard information you need for fundamental analysis, but although the vendor promises to include many more stocks in the near future, currently the program is handicapped by the small number of stocks it analyzes.
—Sharon Rosenberg

FACT FILE

***Compustock*, Version 500 (color), 500M (monochrome)**
A.S. Gibson and Sons Inc
P.O. Box 130, Bountiful, UT 84010; (801) 298-4578
List Price: color, $69, monochrome, $59 **Requires:** 128K RAM, one double-sided disk drive, color/graphics adapter, DOS 2.1 or later; printer recommended.
In Short: A fundamental stock analysis program for long-term investors who are interested in analyzing the (currently limited) stocks it includes.





Compustock uses historic earnings and prices along with regression analysis to compute likely future earnings.

DOW JONES MARKET MICROSCOPE



Dow Jones Market Microscope, available from Dow Jones & Co. Inc., is a product of both Dow Jones of Princeton, New Jersey, and National Softworks of Bethlehem, Pennsylvania. It's a cumbersome investment analysis

software tool that only sophisticated investors who are also experienced computer users would want to attempt to use.

As its name implies, *Market Microscope* enables you to look closely at the market, zeroing in on the stocks and the financial information you select. The program not only allows you to sort and analyze financial information automatically, but it also lets you quickly decide what data you want to analyze. You can choose any combination of 16 out of the 20 financial indicators the program supplies for analysis; you're not locked into any investment theory and are free to experiment with your own strategy.

To take full advantage of *Market Microscope*, you must become a subscriber to Dow Jones News/Retrieval—an often expensive proposition. (Dow Jones waives its $75 startup fee, however, when you purchase this program. You pay only the $12 annual fee plus usage time charges: 90 cents per minute for prime time [6 a.m. to 6 p.m. EST] and 20 cents per minute for nonprime time [6:01 p.m. to 4:01 a.m. EST]). For experienced users, getting the latest financial information is a real plus.

THREE DATABASES With Market Microscope you can use the program's main menu to directly retrieve your choice of 20 out of 68 market data items—such as current price/earnings ratio, current price, and insider net trading—from three Dow Jones News/Retrieval databases: Current Quotes, Media General, or Corporate Earnings Estimator. The Current Quotes database has up-to-the-minute stock prices while the other two databases are updated weekly.

The Media General database supplies information on 3,150 companies listed on the New York and American stock exchanges as well as selected over-the-counter companies. It includes earnings, dividends, price/earnings ratios, and stock price performance relative to market indicators as well as composite information on 170 industries.

The Corporate Earnings Estimator database gives consensus forecasts of earnings per share for 2,400 companies. These forecasts are based on estimates supplied by 1,000 research analysts at 45 major brokerage firms.

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Dow Jones Market Microscope
Dow Jones & Co. Inc.
P.O. Box 300, Princeton, NJ 08540; (609) 452-1511 in N.J.; (800) 257-5114 elsewhere
List Price: $349 **Requires:** 128K RAM, two disk drives, printer, modem, DOS 1.1 or later.
In Short: A screening program that enables you to collect as well as automatically sort and analyze current information on investments; can be difficult to use and expensive—you must subscribe to Dow Jones News/Retrieval to get all the benefits.
CIRCLE 633 ON READER SERVICE CARD





To screen stocks, you select a set of indicators, then list the stocks you want to monitor.

ANALYTICAL ROUTINES Two of the program's most important analytical routines are "Screen stocks and industry groups" and "Print a price alert report." To screen stocks and industry groups, you begin by selecting a set of indicators. You choose and record up to 20 of the 68 available indicators as the basis for analysis. You then create and record a list of stocks and/or industry groups you want to monitor. At that point you go on-line and access the information from Dow Jones News/Retrieval. (Although the startup procedure is relatively easy for experienced computer users, here's where the program becomes more difficult to use and the manual more confusing about the step-by-step procedure to follow.)

Next you specify what *Market Microscope* calls a buy/sell screen, which involves three steps. First, you select up to 16 of the possible 20 indicators you chose as your screening criteria. Second, you specify the ranking order for the indicators: from low to high or high to low. Third, you set critical limits. After that, you automatically obtain a report of stocks in ascending or descending order based on your specified criteria.

To print a price alert report, you create a list of stocks to monitor, establish support and resistance levels, establish threshold levels for up to 12 criteria, and get on-line data from Dow Jones News/Retrieval. *Market Microscope* then gives you a printout of stocks with buy, sell, and update recommendations based on your criteria.

Another feature available is an alphabetical listing of every stock in any group of lists you select, including the most recently updated price and the support and resistance levels.

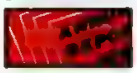
DOCUMENTATION The manual includes information on program error messages, financial terms used, financial indicators available, and lists of industry group codes. One flaw, however, is that it lacks a tutorial section. Although a sample session is included, crucial information is omitted from the step-by-step directions. On the question of exactly when to hook into Dow Jones News/Retrieval, for example, the manual never is explicit enough.

SUMMARY Access to Dow Jones News/Retrieval is in some ways the most valuable part of the program and some-

thing of a drawback at the same time. To utilize the program's features fully, you must access Dow Jones News/Retrieval for key financial information. However, the time you spend on-line can be expensive, especially during prime time. The program's limited capabilities and inadequate documentation make it of questionable value to the serious investor.

—Sharon Rosenberg

MERRILL LYNCH EQUITY SCREEN



Merrill Lynch Equity Screen is a sophisticated stock-screening tool that allows investors to study historical stock prices and analyze corporate data. But the program's annual subscription fee of $4,000, which includes the program, bimonthly updates, and a free copy of any new release, makes it unusually expensive.

Merrill Lynch Equity Screen accesses the Merrill Lynch Equity Database, which contains over 100 data items on approximately 1,100 companies. The data available for each company includes the stock price of each company, high and low price for 52 weeks, earnings per share, sales, beta, dividends, and financial ratios.

SOPHISTICATED SCREENING When you use the package for screening, you not only can specify individual data items, but you also can combine up to six criteria into a grouping. And you can impose restraints on the criteria. For example, you could locate stocks meeting the following criteria: price less than or equal to $10, earnings per share greater than or equal to the industry average, and average price change for the year less than or equal to 5 percent.

While a screening group can contain a maximum of six criteria, you create up to 20 groupings. But you must screen the database for stocks meeting one set of criteria, then screen the results for those meeting the next set of criteria, and so on. In this way, you can screen the database for stocks meeting a large number of criteria. Once you've established your criteria, the package searches the database and finds qualifying securities quickly.

Once you've collected the data, you can save the results in a portfolio or display them in a report. The package does not offer predefined reports; you create your custom reports by highlighting data items from the same listing that you use for screening. You can create reports for a list of stocks gathered from a screening, for a portfolio, or for the entire universe of stocks in the database. You can save the reports for printing or later reuse. Printed reports come with a summary page showing the report specifications and, if applicable, the portfolio involved.

In addition, the program allows you to perform statistical and graphical analyses of company performance. You can calculate mean, median, minimum and maximum values, and standard deviation on a group of stocks from a screening, from a portfolio, or from the entire database of stocks. Regression analysis lets you compare one independent variable to others in order to assess significant correlations among data items.

FLEXIBLE CHARTS *Merrill Lynch Equity Screen* includes useful and flexible graphics. Graphs include bar charts, regression curves, and scatter plots. You can graph any group of stocks you want, including the entire database, or individual data items.

Finally, the package allows you to view all the financial data available for one particular company. The results, listed on the screen, are compared with the industry averages.

Any data you obtain may be downloaded into a *1-2-3* spreadsheet for further analysis.

The package does have a few problems. Selecting the options can be tedious since you must highlight the option and strike the Enter key each time. It would be simpler to use the first letter of the option or the option number. In addition, screens are crowded and difficult to read. Although the package is straightforward and easy to use, error-handling needs improvement. The manual does not adequately explain error messages.

These drawbacks, however, are minor. *Merrill Lynch Equity Screen*'s primary drawback is its steep price. Overall, the

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FACT FILE

Merrill Lynch Equity Screen

Merrill Lynch

165 Broadway; New York, NY 10080; (212) 637-7396

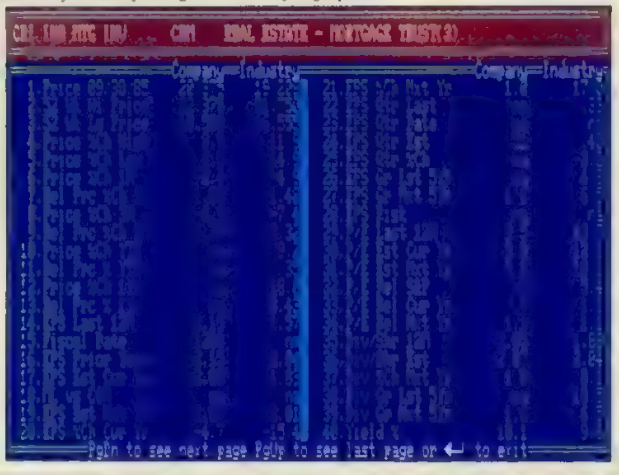
List Price: $4,000 per year subscription fee

Requires: 512K RAM, two double-sided disk drives, DOS 2.0 or later.

In Short: A versatile, reliable, easy-to-use package with a very high price.

CIRCLE 644 ON READER SERVICE CARD





You can view all the financial data available on a company and compare results with industry averages.

package is versatile, reliable, and easy to use, and offers an abundance of valuable information and analyses for financial decision making.—**Sharon Rosenberg and Rosemary Gitto**

MICRO PMS



Micro PMS from The Boston Company is one of the few financial packages on the market that combine stock-screening ability with portfolio management and extensive and flexible reporting features.

The menu-driven system comes on four disks: the *Micro PMS* program disk, a portfolio disk, a master stock disk, and the optional Dow Jones News/Retrieval interface disk. The master stock disk contains 50 technical and fundamental data items for each of 2,000 securities; an updated data disk is sent out on the first business day of every month.

Each portfolio can keep track of up to 50 security holdings and 150 transactions. The program can handle up to ten different security types, including bonds, common stocks, preferred stocks, and options, as well as nine different types of transactions, such as buy, sell, sell short, and income.

The security file holds current price data on all securities. When you enter new price data on a stock split for a given security, *Micro PMS* updates every portfolio where that security appears; this is a useful feature for keeping track of the current value of your portfolio. If you want to enter additional securities to the master stock disk, you can do so manually. As an added benefit, the Associated Ticker field allows you to keep track of both stocks and related securities. Typically, software packages file securities by the ticker symbol of the company—but you can't tell from the ticker symbol if a holding is a stock or an option. The Associated Ticker feature lets you file your stock and option holdings for the same company separately.

MEETING CRITERIA To screen the program's master stock disk for securities that meet specific criteria, you use the security-screening option. This option lets you define and save up to ten screening criteria from the data items on the master stock database. You can also combine two screening criteria using the comparison variable. Thus, for example, you can specify a price/earnings ratio or, combining criteria, screen for companies whose long-term debt is less than 50 percent of capitalization. The program will then scan the master stock database and display qualifying securities. It also shows the number of securities that fail to qualify per criteria, which allows you to determine whether the criteria are too loose or too restrictive. After screening, you can save your chosen criteria for later use and save the qualifying securities in a portfolio.

You may, however, run into problems if you try to change your screening criteria once the screening process has begun. If you rerun the screening with revised criteria, the package ignores the securities already processed, giving you an incomplete picture.

REPORTING POWER *Micro PMS*'s most powerful feature is its reporting. All of the reports are very flexible; you can easily modify them so that, for example, they display only the data you choose for precisely the time period you specify. You produce reports from three menus: the portfolio reporting menu, the portfolio appraisal menu, and the analysis and report generator.

The portfolio reporting menu produces such basic reports as transaction summaries and gain and loss reports (realized and unrealized). You specify the time period for the reports.

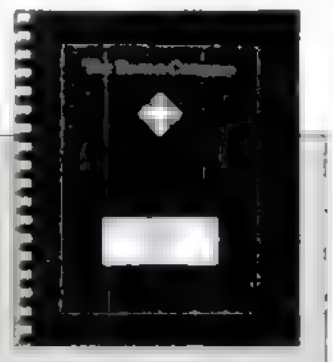
The portfolio appraisal menu includes report formats—that you can modify—for checking on the current status and for tracking the progress of individual or multiple portfolios. To create your own reports, you include up to 13 data items such as ticker symbols, date bought, lot, units owned, total cost, and market price. The reports list securities alphabetically or by lot purchased. Another report from this menu cross-references individual securities through multiple portfolios.

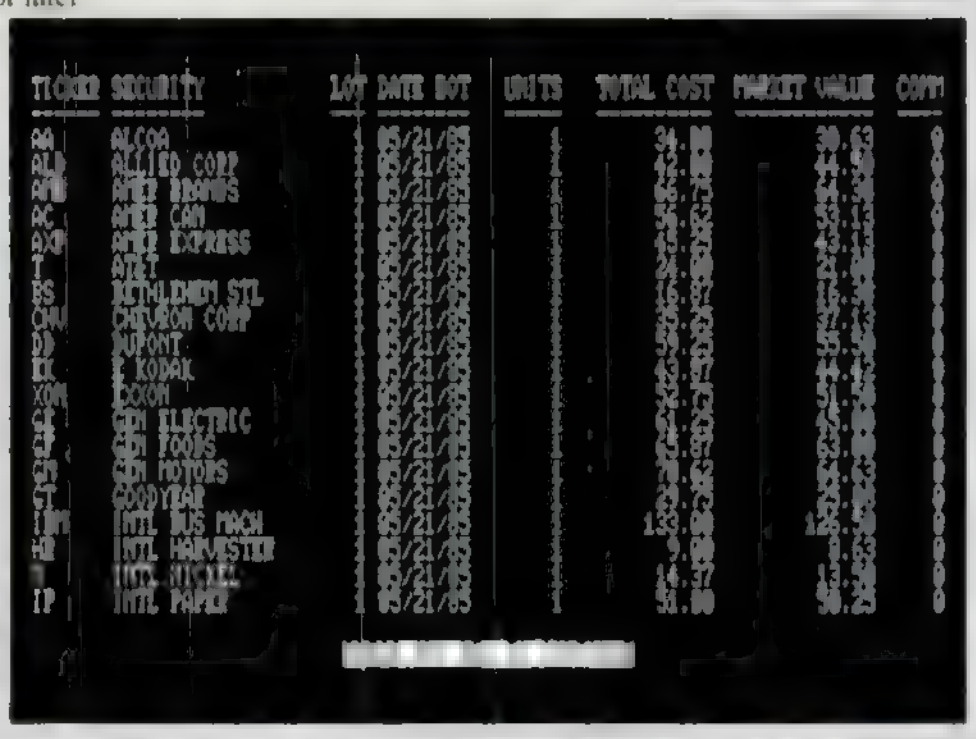
If the portfolio appraisal menu is not flexible enough, you can design your own reports from data items in the security-screening section, using the analysis and report generator. You can save up to ten report formats on disk.

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***Micro PMS*, Version 5.0**
The Boston Company
One Boston Place, Boston, MA 02106; (800) 468-8324;
In Mass.: (617) 722-7928
List Price: $495 **Requires:** 128K RAM, two double-sided drives, Dow Jones Interface, DOS 2.0 or later
In Short: A portfolio management and stock-screening system that allows you to customize reports

CIRCLE 645 ON READER SERVICE CARD





Custom reports include up to 13 data items such as lot, units owned, and market value.

The analysis and report generator within the program also lets you create bar charts and *x-y* graphs, which plot any two data items from the security-screening section. The graphs plot points for every security in your stock portfolio. Since the plot points for the *x-y* graphs are ticker symbols, reading the graph can become quite difficult.

TARGET PORTFOLIOS The last major report feature is the portfolio enhancer, which produces three "target" portfolios: high growth, income, and aggressive. The target portfolios contain actual securities and exemplify the characteristics of each type of portfolio. For example, an income portfolio would contain stocks with high dividends per share, while an aggressive portfolio would hold riskier stocks that carry the promise of registering capital gains. You can compare your portfolio to one of these targets to see whether it will meet your pre-established investment objectives. You can also use this feature to devise scenarios and test possible results.

The manual is well written and clearly explains what each of the program's many functions do. A nice little extra is the package's save-reminder feature, which forces you to save work on one portfolio before loading another. This feature is a lovely benefit for investors who have a lot on their minds.

However, *Micro PMS* has one significant flaw. Even though the program gives you the option of sending the reports to either the screen or the printer, neither option works if you don't have a printer. The *Micro PMS* support group was unaware of the problem and later expressed doubts over whether the problem would ever be fixed. Another problem is the substantial amount of disk shuffling involved when you're working on a double-disk-drive system. Though not a major flaw, it can be tiresome if you are constantly switching back and forth between the portfolio and security programs.

Despite its relatively minor flaws, *Micro PMS* gives both individual and professional investors a complete portfolio management and security-screening system that offers a great deal of reporting flexibility.—**Rosemary Gitto and Sharon Rosenberg**

★ EDITOR'S CHOICE

STOCKPAK-II



Standard & Poor's Corporation, a leading financial information supplier, has devised a new format for dispensing financial information: *Stockpak-II*. A fast screening program with its own database disks, *Stockpak-II* assists you in organizing the significant financial information that will support your investment decisions. The program is written in FORTH, a new, fast combined programming language and operating system.

FINANCIAL DATABASES ON-DISK *Stockpak-II* consists of a program disk and up to four different database disks. Each database disk includes financial information on as many as 1,500 companies. Two of the databases have information on about 1,500 stocks listed on the New York and American stock exchanges. A third consists of two disks that contain information on a total of 2,200 over-the-counter stocks. Finally, a composite database offers information on stocks of 1,500 leading companies listed on the New York and American stock exchanges or sold as over-the-counter securities. A *Stockpak-II* user may subscribe to any combination of the four possible databases.

Monthly subscriptions are available for updates on financial information contained in the databases. Standard & Poor's makes these updates on the last trading day of each month; subscribers normally receive their updates around the tenth day of the following month.

Each *Stockpak-II* database disk supplies information on more than 100 items pertaining to each company. These items include information on company assets and liabilities, sales, earnings per share, Standard & Poor's proprietary ranking for each company, and its earnings per share estimates. In addition, there's information on balance sheet and income statement data as well as general information such as the company's industry code, fiscal year-end, and option availability.

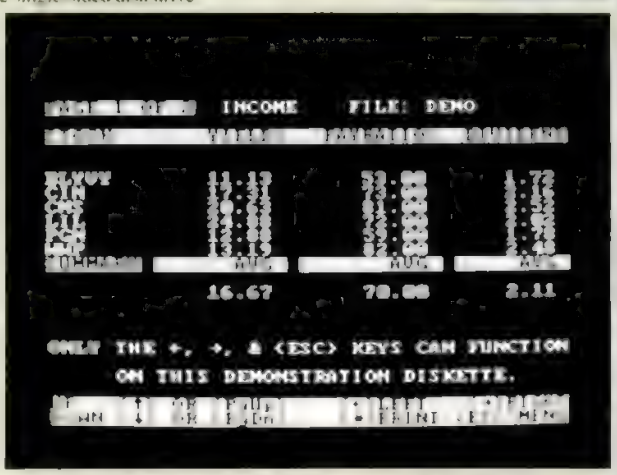
USING THE PROGRAM The program comes ready to use and requires no installation. You merely place the floppy disks into the disk drives, turn on the power, and

PC FACT FILE



Stockpak-II
Standard & Poor's Corp.
25 Broadway; New York, NY 10004; (212) 208-8581 in N.Y., (800) 852-5200 elsewhere
List Price: $275 to $1,000, depending on database(s) selected
Requires: 128K RAM, one single-sided disk drive
In Short: An easy-to-use, fast screening program with database disks for individual and professional investors; enables you to create useful subset files of the monthly databases and to customize reports

634 ON READER SERVICE CARD



Stockpak-II has reports with standard formats, and it lets you customize reports.

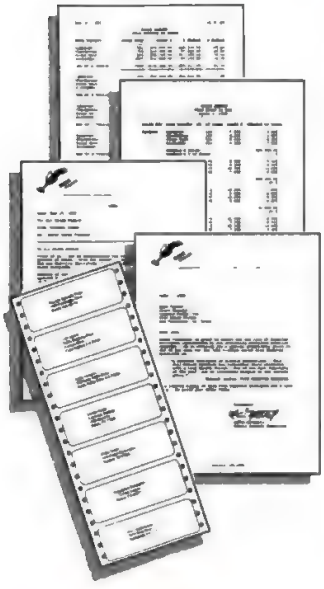
Using Lotus 1-2-3® without Reflex is like driving at night without lights

If you use Lotus 1-2-3 you need Reflex, the Analyst™ because it shows you what 1-2-3 either hides in the dark or can't show you at all. Reflex shows you relationships and inter-relationships in your data that you can't afford to miss.

Reflex includes the best Report Generator for Lotus 1-2-3.

Reflex includes the Report Generator that 1-2-3 should have included — but didn't. With Reflex, you can generate reports, graphs, charts and diagrams *from* your 1-2-3 worksheets that are impossible to generate *with* 1-2-3.

You can do sales reports, letters, memos, invoices and mailing labels — to name a few — and you can see a few of them on this page.



Reflex is the best database for 1-2-3 users and it's also the easiest to use.

Reflex is the first database that separates the trees from the forest. The first database that understands that what you see depends on how you look at it.

The first database that probes relationships — then shows them to you in various graphic forms — scatter, line, bar, stacked bar and pie charts. The first database to break the bonds of traditional database management and give a dramatic visual turn to data analysis.

Reflex makes graphic leaps far beyond 1-2-3. With Reflex, when you look, you see.

Reflex gives you five new and different views of what's hidden in your 1-2-3 worksheets.

Form View, *List* View, *Graph* View, *CrossTab* and *Report* View.

Form View lets you create your database. *List* View shows you your data in tabular list form, just like a spreadsheet. *Graph* View gives you instant interactive graphic representations; *CrossTab* View gives you amazing "cross-referenced" pictures of the links and relationships hidden in your data. *Report* View allows you to use information from 1-2-3, and then print out reports in all sorts of different formats.

The commands for all five Views are consistent — so you're not stuck learning five different ways to get something done. And because Reflex uses advanced windowing techniques, you can see several views on the screen at the same time — without having to switch back and forth. You get the picture, and the pictures, all at once.

Whether you're a 1-2-3 user or not, Reflex answers all your "What Ifs?" and leads you to the right conclusions.

With Reflex when you modify a number all your Views — List, Form and Graph — are immediately updated, on-screen.

Let's say you're analyzing "*Traveling Expenses by Salesperson*" and you ask, "What if they stayed at a *Motel 5¼* instead of the Presidential Suite of the *Hotel Chic*?" "Show me." So Reflex shows you.

"What if they could no longer order $100 wines, but had to stick to the stuff that matures in the truck?" "Show me." So Reflex shows you. Instant answers. Instant pictures. Instant analysis. Instant understanding.

Of course Reflex can do all of the above with or without 1-2-3. Reflex is a *complete* database management and analytical tool that stands on its own feet and helps you stay on yours because it's only $99.95!

Borland's $99.95 Reflex could be the best business investment you'll ever make.

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System requirements:
IBM® PC, XT, AT, or compatibles. 384K RAM minimum. IBM Color Graphics Adapter®, Hercules Monochrome Graphics Card™, or equivalent. PC DOS® 2.0 or greater. Hard disk and mouse optional.

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in a few seconds the program's main menu appears on the screen.

From the main menu, *Stockpak-II* offers four ways for you to access and retrieve information about a company. The "Look up information on one company" choice gives you quick and easy access to the information on any company on a database disk. "Compare information on several companies" allows you to compare the performance of any of the companies on the data disk. "Prepare a report" lets you produce printed reports of the available information for the companies in the database. (For these three options you use ticker symbols to identify companies.) "Screen a database diskette" allows you to locate any company that meets a criterion, or set of criteria, of your choosing.

USING LOOK UP When you use the "Look up" option, *Stockpak-II* presents three display pages containing predefined data items. To look up information on a given company, you enter the ticker symbol for that company, and *Stockpak-II* shows three display pages containing 83 predefined data items and up to 16 data items you define. It also shows two bar charts, the first comparing the earnings per share for each of the last 5 years with the estimated earnings per share for the next fiscal year and the other, showing sales for each of the last 5 years.

IMPRESSIVE SCREENING *Stockpak-II*'s screening ability is impressive. After you define your own screening criteria or use one of the ten predefined criteria sets, the program searches through the database disk for companies that meet these standards. A typical screening takes less than 30 seconds; you can do multiple screenings very rapidly. You can screen 1,500 stocks, for example, in a matter of seconds.

A list of ticker symbols for the companies fitting your criteria is brought up after the program finishes screening a database. At this point, you can save the ticker symbols in a spin-off file and create reports either in ten ready-made formats or in one you define. A spin-off file is a subset of the monthly database file that can hasten the process of preparing a report and creating comparison graphs.

GRAPHS AND REPORTS *Stockpak-II* can compare information on several different companies graphically. Comparisons are available in two formats: multiple graph and single graph. After you have chosen the comparison option from the main menu, you enter the company ticker symbols and the data items to be compared. You can enter the ticker symbols automatically from a spin-off file if you like.

Stockpak-II gives you two ways of creating reports: from the file of database-supplied information you've saved to disk (the spin-off file) or, as you input data, from ticker symbols on the main menu. The reports have standard formats; when you enter the name of the company, for example, the report would give you summary information on average company earnings. You also can easily create your own report formats, customizing them to suit your needs.

IN SUM *Stockpak-II* is easy to use for both individual and professional investors. Its user-defined reports feature, spin-off file facility, and speedy stock-screening will save you time and effort. *Stockpak-II* enables you to manipulate large quantities of financial information readily and effectively.—**Sharon Rosenberg**

THE EVALUATION FORM

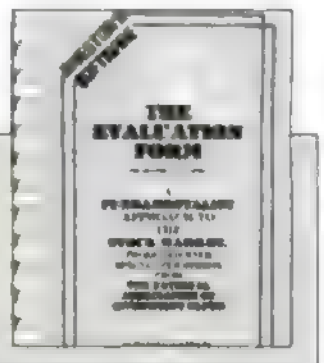
Published with special permission from the National Association of Investors Corporation of Royal Oak, Michigan, *The Evaluation Form* is a computerized version of the NAIC's format. Using the NAIC fundamental analysis approach, which was developed in 1951, investors have consistently outperformed industry averages.

Investors familiar with the NAIC approach will find that *The Evaluation Form* greatly speeds up their analyses. Basically, the package takes data on a company's sales, profits, expenses, and so forth; calculates about 50 values including buy, hold, and sell ranges; and organizes it into a compact format. By analyzing this fundamental data, you are able to determine

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***The Evaluation Form*, Version 2.0**
Investor's Software
Box N; Bradenton Beach, FL 33510; (813) 778-5515
List Price: $100 **Requires:** 128K RAM, two single-sided disk drives, DOS 1.1 or later.
In Short: A limited package that simply helps you organize fundamental stock data into a National Association of Investors Corporation format. The glossary in the user guide, however, makes it a good educational tool for someone wanting to learn more about fundamental analysis

CIRCLE **646** ON READER SERVICE CARD





The Evaluation Form *organizes data into a form you can use to assess a company's value.*

Because you need the right word, the right phrase, the right meaning, and the right answer, *right now*, you need Borland's Turbo Lightning™

Since you write, think, work, live, breathe, and ask questions, you need the instant electronic support of Turbo Lightning—the fastest, most amazing information system since your brain.



You need the power of an astonishing program that checks your spelling *as you type*. The versatility of a program that gives you instant access to the 50,000-word Random House® Thesaurus and the 80,000-word Random House Concise Dictionary. The retentiveness of a program that remembers your name and any other words you teach it. The adaptability of a program that lets you do all of the above—while you run other programs. And of course the growth path of a program that is rapidly developing into a body of fully-fledged electronic reference works called the Turbo Lightning Library.™

Turbo Lightning checks your spelling as you type and while you run other programs

You could be running Lotus 1-2-3,® MultiMate,™ MicroStar,™ Reflex,™ SideKick,® WordStar,® or WhatEver,® it doesn't matter which one, because as you write, Turbo Lightning watches how you spell every word, and is ready to alert you to any mistakes.

So let's say your neighbor, who already has 23 unmatched sets of plastic flamingos on his front lawn, a broken boat trailer, and a mattress, has now brought back a coyote from a hunting trip. It howls all night, and you're writing a letter involving the word IDIOT, but you accidentally typed IDOIT. What happens then? You immediately *hear* a beep, so you know something's up. You instantly *see* a window that doesn't list IDOIT, but it does list IDIOT and its sound-alike words, so your screen window looks like this:

B. IDIOTS
C. IDIOM
D. IDIOTIC
E. INDICT
F. IDIOMS
G. ADD WORD TO AUXILIARY DICTIONARY

So you move your cursor to A, which is the correct spelling for IDIOT, hit return, and the spelling mistake is instantly fixed.

Turbo Lightning also gives you instant synonyms

IDIOT was the word you planned to use in your note next door, but is it the best word? And should you use that particular word since your neighbor fools around with his guns when he's full of whisky (which is every night), and besides that, he's 6'10", a black belt, and your cousin?

Because you have Turbo Lightning's Random House Thesaurus at your fingertips, you can look at the *synonyms* for IDIOT. Type in IDIOT and what you see is:

- NOUN -
A. CRETIN
B. MORON
C. HALF-WIT
D. BLOCKHEAD
E. JERK
F. NITWIT
G. FOOL

Any one of which expresses your opinion of your cousin's mental stature. So write the letter, but *don't mail it!*

Turbo Lightning won't forget your name

Teach Turbo Lightning your name and it's there—correctly spelled—forever. So are all the other names and words you teach Turbo to help run your business and personal life.

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Until September 1, 1986, just $99.95 gets you Turbo Lightning, which is an incredible deal when you look at what you're getting: the access system or *engine* that powers the first two volumes and *future volumes* of the Turbo Lightning Library.

And for only $149.96, you can get *both* Turbo Lightning and the Word Wizard, which is so intriguing, you'll probably be up half the night. And if that happens, sneak next door around 4A.M., unchain the coyote, and let it run away!

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If you're interested in the nuts and bolts, Word Wizard includes Turbo Pascal source code and all the technical information you're ever likely to need.

The Word Wizard has thousands of ways to jumble, scramble, and boggle your mind. Sold separately, our new Word Wizard is $69.95, but you can get it now with Turbo Lightning for only $149.95, which saves you $19.05. Give yourself a word-break, get the Word Wizard today!



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Minimum System Requirements: 128K

L7



the value a company's stock represents at any given price.

GLOSSARY HELP FOR BEGINNERS The package's 99-page manual is clear and concise and even includes a glossary that explains terms used frequently within the package. This glossary could prove invaluable to a beginning investor who wants to learn more about fundamental stock analysis and its attendant jargon and terminology.

Unfortunately, the installation procedures are not so straightforward. It's easy to be overwhelmed by the volume and technical content of the instructions. For example, instead of supplying separate documentation for each version of the product, the company forces you to leaf through installation instructions for all versions, including those for MS-DOS, CP/M, Apple II, Commodore 64, and TRS-80 computers.

Once you've installed the program, you load and run it from BASICA. In fact, BASIC function key commands remain in operation when you use the program; so you must be careful not to press any of the function keys by accident or you may find yourself thrown out of the program. If you haven't already saved your work when this happens, you could lose your data.

MANUAL DATA ENTRY To enter data for a new company, you choose option 1 on the main menu. The program then asks you for the company name, the exchange, the ticker symbol, the date, the last full year of data, the date of published data, and the source of information, that is, Standard & Poor's, Value Line Investment Survey, or both. Next, it prompts you to input such statistics as net before taxes, earnings per share, book value, high and low price, present price, low price this year, current dividend, and latest quarterly earnings per share—for the company you are reviewing. Unfortunately, since the program does not access an on-line data service, you must type in all of this data manually.

Once you have entered the information, you save your completed data and return to the main menu. At this point, you can preview the information on the screen or select the option for printing a hard copy. The printout is a two-page form that organizes your fundamental data into a compact format. The first page of the printout is broken up into six areas, including a table that calculates high and low price/earnings ratios; a table with such data as stock prices, earnings per share, book value, and so forth for a stock over time; and one that shows compounded annual growth rates for the past 5 years. The second presents answers to a variety of questions relevant to the specific approach that the NAIC promotes.

Investor's Software, the vendor, does not provide updates reflecting program changes to its software purchasers. Furthermore, it's not easy to reach Investor's Software when using the telephone number listed in the user guide. Once reached, however, the company's representatives are eager to help.

Its helpful glossary makes *The Evaluation Form* appropriate for the individual investor who wants to learn more about fundamental analysis. Because of its manual data entry, however, I would recommend this program only for investors who have the luxury of time.

—Sharon Rosenberg

★ EDITOR'S CHOICE

VALUE/SCREEN PLUS



With over 50 years of experience on Wall Street, the Value Line organization is best known for its *Value Line Investment Survey,* a well-known investment advisory publication.

Value Line Inc. has applied its considerable expertise to developing *Value/Screen Plus,* a stock-screening program that accesses Value Line's vast database of annual and quarterly financial records for 1,650 industrial, transportation, utility, retail, and financial companies. The database includes 37 investment variables for each stock. This information covers more than 95 percent of the trading activity on all U.S. stock exchanges.

By the time this review comes out, *Value/Screen Plus* should be generally available. We reviewed a beta version. This package is a new and much improved update of the *Value/Screen* package. The package is available on an annual subscrip-

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Value/Screen Plus
Value Line Inc.
711 Third Ave.; New York, NY 10017; (212) 687-3965
List Price: Monthly subscriptions are $348 per year; quarterly subscriptions are $211 for the first year and $162 for a renewal.
Requires: 256K RAM, two double-sided drives, DOS 2.0 or later.
In Short: A well-designed and easy-to-use stock-screening package that includes basic portfolio management capabilities

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After screening, you can create reports based on any number of screening variables such as those shown here.

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Traveling SideKick is an organizer, a binder, a software program and a report generator that picks your SideKick's brain, then prints out your appointments, daily, weekly, monthly, or yearly calendar, your phone lists, and mailing labels, itinerary, or whatever else you need.

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Minimum System Requirements

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FUNDAMENTAL ANALYSIS SUMMARY OF FEATURES

Product	Price	Number of data disks	Number of companies	Databases accessed	Stock exchange data	SCREENING FEATURES: Total items screened	Number of user defined screening items	Combines screening criteria	Maximum number of items per screening	User specified ranges and limits
SCREENING PACKAGES										
Compustock	$69	2	1,000–1,200	CS, CSTK, DJN/R	NYSE, AMEX, OTC	50	7	■	50	■
Dow Jones Market Microscope	$349	All on-line	over 4,000	DJN/R	NYSE, AMEX, OTC, Pacific Midwest	68	0	■	20	■
Merrill Lynch Equity Screen	Over $4,000	1	1,400	ML	NYSE, AMEX, OTC	103	3	■	6	■
Micro PMS	$495	4	2,000	DJN/R	N/A	50	0	■	10	
Stockpak-II	$275–$1,000	1–4	1,500–4,500	SP	NYSE, AMEX, OTC	108	25	■	7	■
Value/Screen Plus	$348	1 per month	1,630	VL	NYSE, AMEX, OTC	37	0	■	37	■
SPECIFIC FUNDAMENTAL APPROACH										
The Evaluation Form	$100	N/A	N/A	*	N/A	N/A	N/A	N/A	N/A	N/A

Abbreviations: CS - CompuServe, CSTK - Compustock's own database, DJN/R - Dow Jones News Retrieval, ML - Merrill Lynch's Proprietary Equity Database, SP - Standard & Poor's own database, VL - Value Line's own database, N/A - Not applicable, *Manual data entry, ■ means yes

tion basis. You receive one program disk and one data disk with your subscription, and you can choose to subscribe to updates on a monthly or quarterly basis.

Value/Screen Plus's menu-driven format makes it easy for novice and expert computer users alike to maneuver around the package. From the main menu, you can easily install the package, screen the database, analyze a list of stocks, create reports on a list of stocks, or set up a portfolio. And if you have any trouble, you can press F1 to call up the excellent context-sensitive help screens. The help function will also enable you to learn the package quickly. Unlike the previous version of the package, however, *Value/Screen Plus* does not include a tutorial or sample data.

Once you've completed the easy installation procedure, you can perform any of the operations on the main menu. To screen the database, you can select criteria from any or all of the 37 variables, arranged in four different categories: ratings and estimates, market data, historical measures, and growth projections. Criteria within these categories include market price, earnings, sales, dividends, assets, and various financial ratios. Selecting criteria is easy; you simply press the first letter of the desired category. For each criterion, you then specify a value and a relationship—less than, greater than, or equal to—between the criterion and the value by pressing the Plus or Minus key on the numeric keypad. For example, you could screen the database for companies with earnings per share of greater than $3.

When the program completes the screening process, it displays the number of securities that satisfy the criteria. To see the names of the stocks, you press F5. When using more than one variable, the program bases successive screenings only on stocks satisfying all criteria. In this way, you can assess the importance and effectiveness of each variable. If you wish, you can save stock lists and screening criteria as a file. Later, you can reuse your saved screening criteria. The package also has the capability to transfer data into a spreadsheet program via a DIF file.

REPORTS Once you've finished screening, you can create reports based on any number of stocks, using any or all of the 37 screening variables. Reports can be as simple as an alphabetic listing of the company names or as complex as 20 columns of statistical data. You can save up to 20 report formats for later use.

To create reports, you choose from a screen similar to the one used for stock screening. A menu listing the categories remains on the screen during this process, making report creation easy. In addition, you can add the company name and ticker symbol to the reports. The number of data items in your reports is limited by the number of characters that will fit on your screen or on a printed out page. If you choose to view reports on-screen, the package will display 80 characters of text. Printed reports can run 80 or 132 characters across in regular or compressed print. An on-screen counter keeps you under the character limit by telling you how much space you have left. If you exceed the allotted space, the counter displays a negative number.

PORTFOLIO MANAGEMENT Finally, *Value/Screen Plus* includes a simple portfolio manager that gives you a place to keep track of your list of stocks. If you're a broker, you'll need a more comprehensive package, but an individual investor could use this program to keep track of a portfolio of stocks. The portfolio management section also allows you to generate preformatted reports on such things as valuation, unrealized gain and income.

The manual is easy to understand and well organized. It thoroughly explains the installation procedures and includes clear explanations of the essential functions and commands. You can find definitions of the financial variables; industry codes are listed either numerically and alphabetically in the reference section of the manual.

Overall, *Value/Screen Plus* is very well designed and easy to use. I would highly recommend *Value Screen Plus* for anyone who is interested in screening for stocks.—**Sharon Rosenberg**



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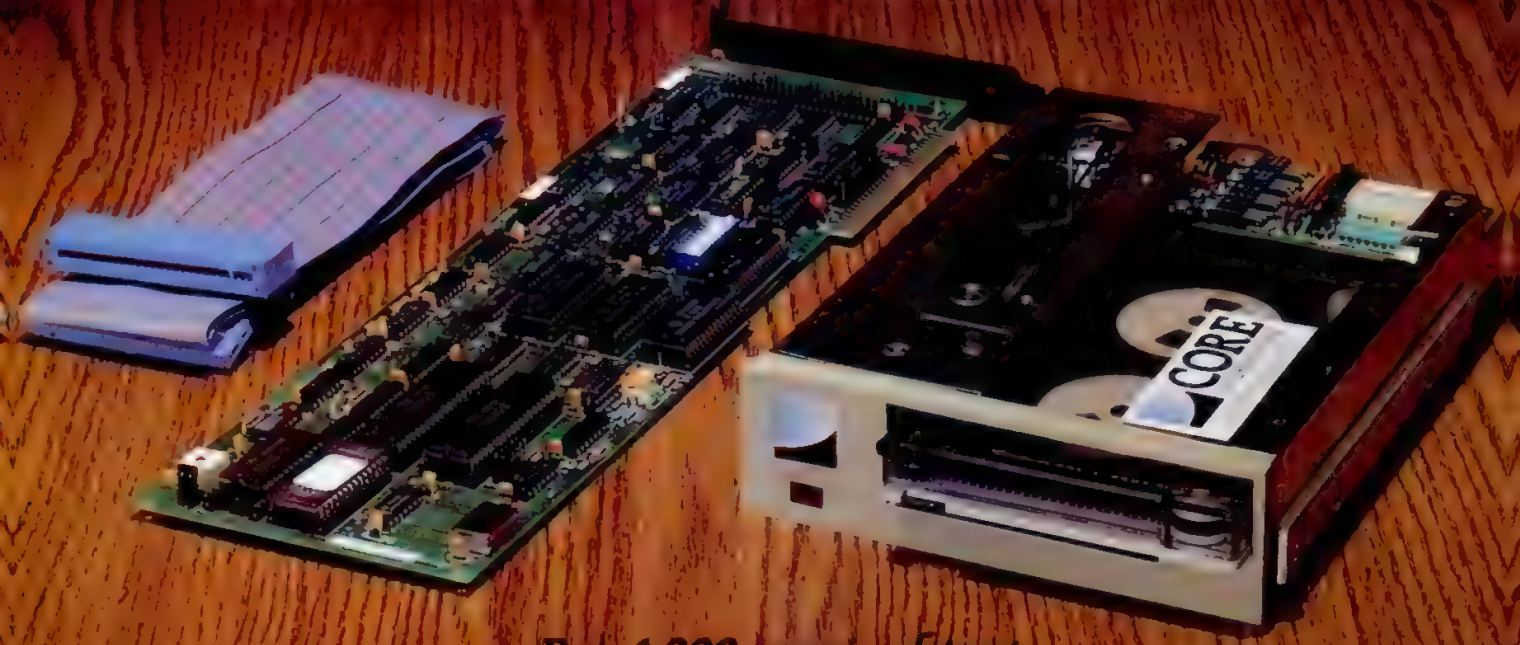
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— Exasperated 1:16

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Investment Software

PORTFOLIO MANAGEMENT



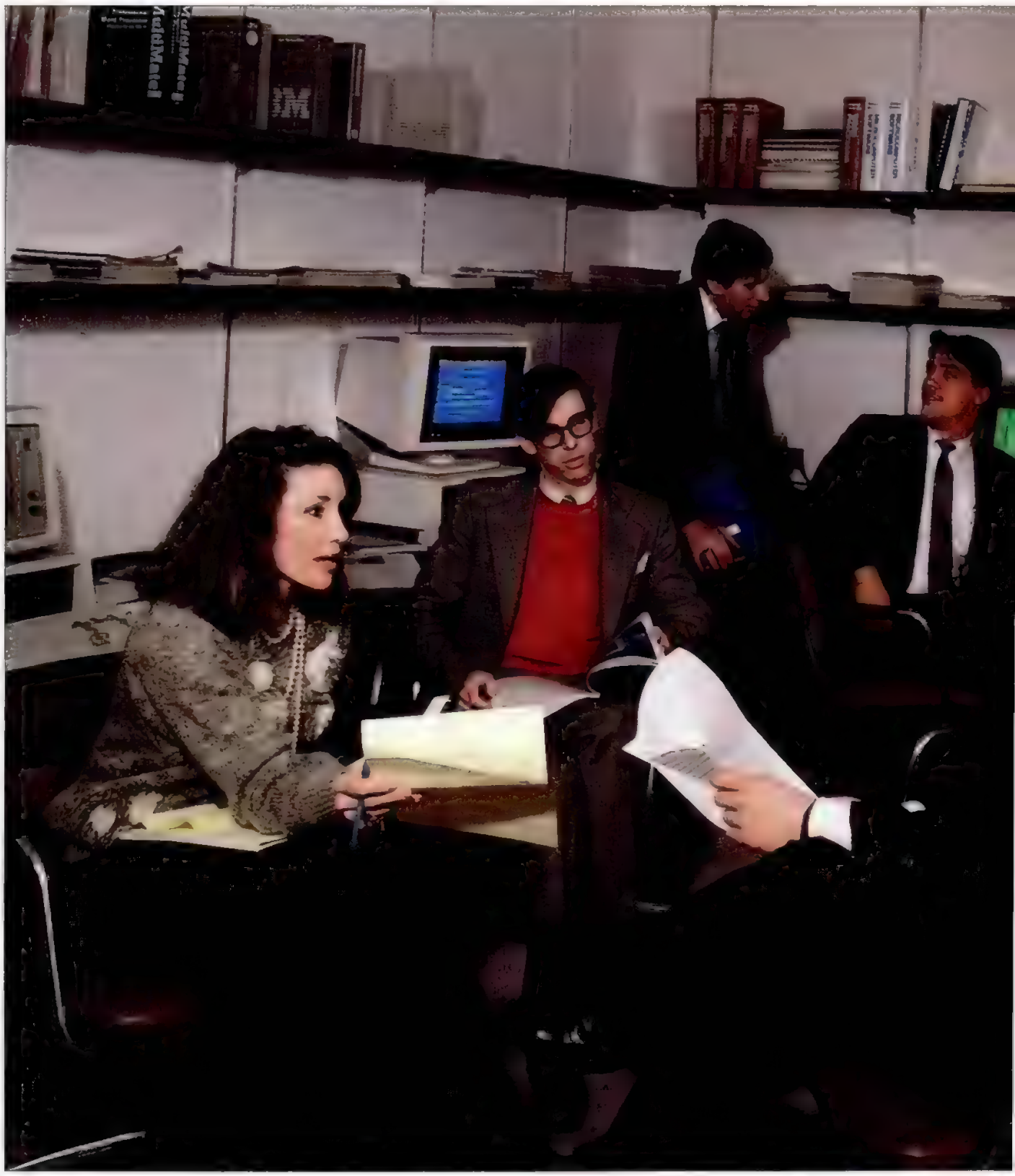
Once you've assembled a portfolio, you'll have to track its changing value. Analysts from Shearson Lehman Brothers evaluate 16 packages for individual investors and professional money managers that help maintain profitable portfolios by calculating data quickly and accurately.

You've used either a technical or fundamental analysis package to select securities that meet your investment criteria. Now comes the hard part: You have to keep a close eye on the ever-changing value of your investments and keep accurate records for tax purposes.

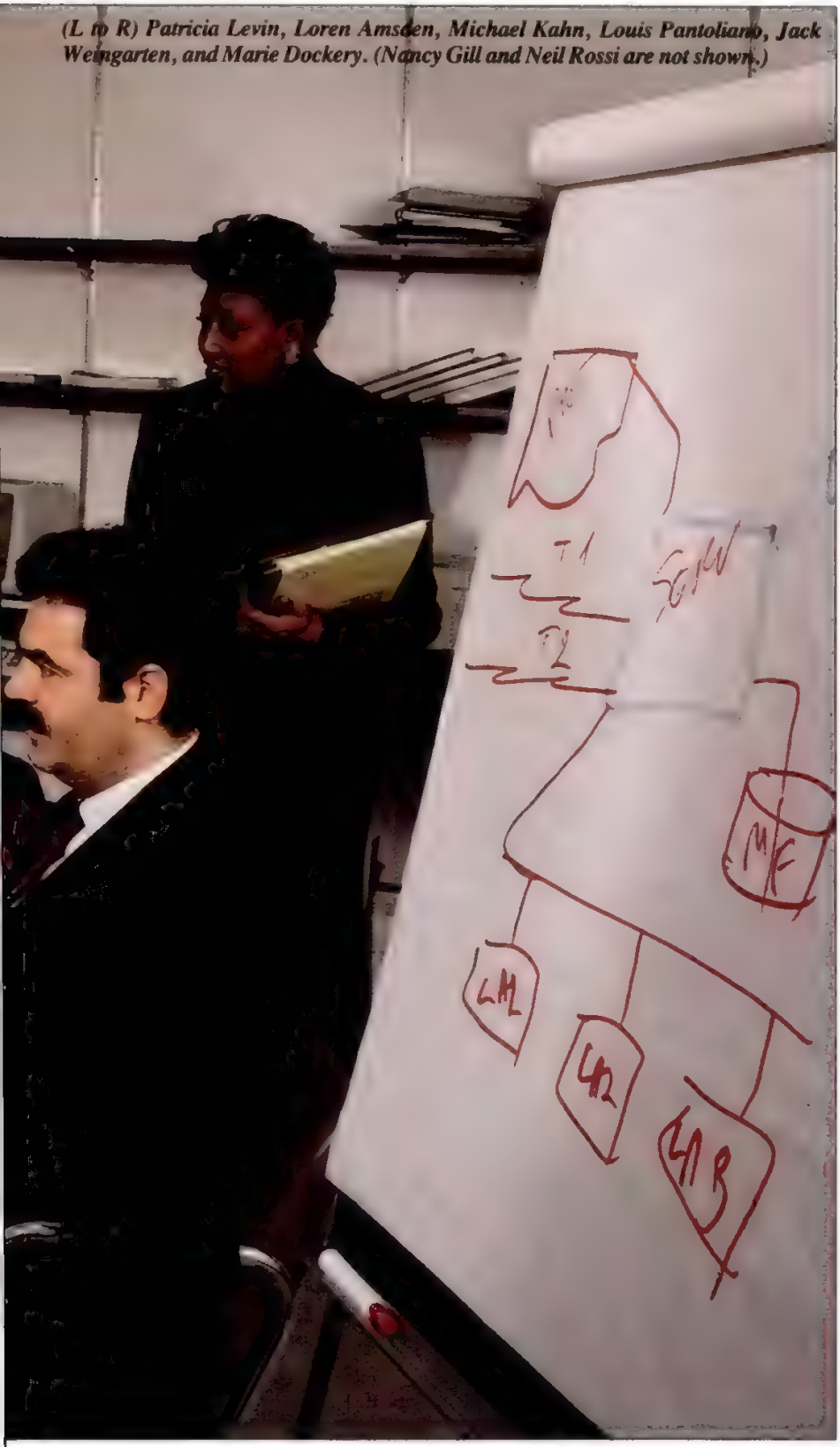
Actually, monitoring your portfolio is not all that difficult. You need to price out your holdings at their current value and evaluate each investment as well as the entire portfolio using a variety of performance measures. How often you review your portfolio depends on the types of investments you own and whether you take a short- or long-term approach to investing.

As you may have guessed, monitoring your portfolio requires many calculations and manipulations of key portfolio information—and all that takes time. But by using your PC and portfolio management software, you can perform the necessary calculations quickly and accurately. You can then manipulate portfolio data into a variety of reports so that you can properly review your holdings.

A portfolio management package is basically a database application. You enter key portfolio information, and the package stores it, performs calculations on it, and sorts data into standard reports.



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(L to R) Patricia Levin, Loren Amsden, Michael Kahn, Louis Pantoliano, Jack Weingarten, and Marie Dockery. (Nancy Gill and Neil Rossi are not shown.)

INDIVIDUAL OR PROFESSIONAL A professional account manager and an individual investor would not use the same package. If you're a private investor, you'll need to track your own portfolio and probably another of imaginary or planned holdings, comparing their performance to actual holdings.

OUR TEAM AT SHEARSON LEHMAN BROTHERS

Loren Amsden *is an internal consultant to Shearson Lehman Brothers. He writes training aids for the firm's brokers who use personal computers to manage their portfolios and also edits Shearson's in-house* Personal Computing Newsletter.

Marie Dockery *is a member of the Hotline Support Group, which makes hardware and software recommendations and provides computer support to financial consultants in the firm's Advanced Technology Department.*

Nancy Gill *is project manager of Shearson's Hotline Support Group. She oversees technical PC hardware and software support to Shearson's financial consultants.*

Michael Kahn *is a member of Shearson's Hotline Support Group. He also writes database applications for various Shearson departments.*

Patricia Levin *is the newest microcomputer specialist for the Hotline Support Group.*

Louis Pantoliano *is a microcomputer specialist with the Hotline Support Group.*

Neil Rossi *is project manager for microcomputer software development at Shearson. He has been involved with computers for over 15 years.*

Jack Weingarten *is a vice president in charge of Shearson's Advanced Technology Department, which is responsible for providing total personal computer support to financial consultants using PCs.*

A professional portfolio manager, needs a much more sophisticated and usually expensive system. Software packages for professionals not only track many portfolios for many clients but they also help in prospecting for new clients. They include extensive database capabilities, which allow you to enter data on clients' and prospective clients' interests, occupations, investment preferences, and other characteristics. Once the data is entered, they'll allow you to screen it for clients that meet specified criteria, such as those interested in municipal bonds or who have a tendency to buy high-technology stocks.

After screening the data, these packages will generate a list of names, addresses, account numbers, and phone numbers. Some packages even print mailing labels and prepare personalized letters based on security holdings and interest criteria.

Also, professional packages often keep extensive notes for you on telephone conversations with clients and prospects. Given the large number of clients and prospects that a professional talks to on a regular basis, it is important to be able to keep track of what is said to whom and when.

Many packages for professionals have a calendar feature that lets users leave reminders to follow up on a conversation later. You can usually print these reminders on a daily or weekly basis.

But whether you're a professional or an individual investor looking for a portfolio manager, you'll need a guide to which packages are good for various purposes. We, therefore, asked a team of experts from Shearson Lehman Brothers to examine 16 portfolio management packages currently on the market. When our reviewers looked at the packages, evaluating them on the basis of the type of user the package is most suitable for, they looked at the professional capabilities mentioned above. In addition, they looked at the security types, data entry, and reports. The following discussion provides a guide to what our reviewers were looking for when they evaluated the packages.

SECURITY TYPES The types of securities you can maintain is one of the first things you should look for in a portfolio management package. If the package cannot track the types of securities you own, it will be virtually worthless to you.

Packages for professionals usually track a wide range of security types, such

PORTFOLIO MANAGEMENT
GLOSSARY OF TERMS

Capital gain/loss The difference between the purchase and sale price of a security. If the purchase price is less than the sale price, it is a capital gain. A capital loss is the reverse.

Commission The fee charged by a stockbroker for buying and selling securities on behalf of a customer.

Dividends Payments to stockholders of a portion of the profits of a company.

Ex-dividend date Dividends are paid to stockholders owning shares as of a specified date known as the ex–dividend date.

Long-term If you hold securities long term, for longer than 6 months, the Internal Revenue Service grants them a more favorable tax treatment.

Margin Using securities purchased with cash as collateral for additional securities that are purchased with money borrowed from a stockbroker.

Portfolio Investment holdings. By including a variety of stocks and bonds as well as other investments, portfolios are designed to achieve income and capital gain objectives and minimize risk.

Short sale A trading technique typically used when you expect the price of a stock to decline. An investor sells borrowed shares and hopes to buy the same number of shares at a later date for a lower price, return them to the lender, and realize a profit.

Short-term As defined by Internal Revenue Service guidelines, holding a security for less than a 6 month period qualifies those securities for short-term tax treatment.

Stock split Occurs when a company divides its shares into a greater or lesser number. Normally, stock splits are used to reduce the price per share in order to increase the activity of the shares in the market.

Ticker symbol An abbreviation used by the exchanges to identify a particular security.

SECURITY TYPES

Bond A long-term debt obligation of a company. Interest is paid to the bondholder at a set rate until the principal amount is repaid on the maturity date.

Commodity One of a select group of items traded on one of the commodity exchanges for either immediate or future delivery. Examples include corn, sugar, cotton, cattle, gold, and silver.

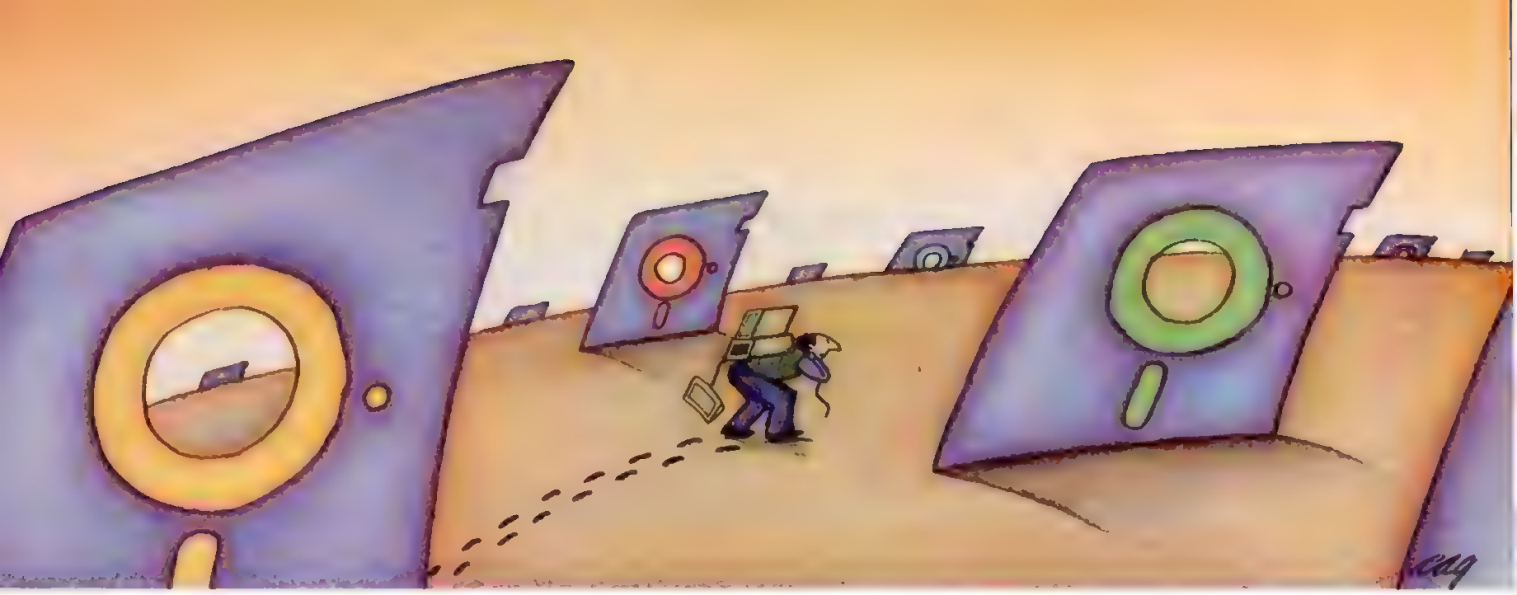
Common stock Common stock represents ownership of a corporation. Generally, common stockholders have voting rights that allow them to control management and company policy.

Mutual fund A professionally managed portfolio of securities.

Option A speculative market instrument that represents the right to buy or sell a stock at a fixed price within a specified time period. Call options represent the right to buy; put options represent the right to sell.

Preferred stock Represents ownership of a corporation, without voting rights. Preferred stockholders receive a fixed annual dividend that must be paid before common stockholders receive anything.

Treasury bill A short-term debt obligation of the U.S. Treasury that matures within 1 year.



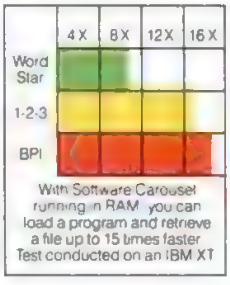
PROBLEM: There's just no easy way to move from one software program to another.

THE SOFTLOGIC SOLUTION: Software Carousel

Now you can keep up to 10 programs loaded and ready to run.

Hard to believe, but some people are happy with just one kind of PC software. Well, this is not a product for them.

But if you're someone who depends on many packages, all the time—someone who'd use several programs at once if you could, well now you can. With Software Carousel.



With Software Carousel running in RAM you can load a program and retrieve a file up to 15 times faster. Test conducted on an IBM XT.

Why call it "Software Carousel"?

In some ways, Software Carousel works like the slide projector you're used to. You load a handful of pictures, view one at a time, then quickly switch to another. A simple idea, with powerful possibilities for computing.

Here's how it works. When you start Software Carousel, just tell it how much memory you have, load your software and go to work.

Need to crunch numbers? Switch to your spreadsheet. Need your word processor? Don't bother saving your spreadsheet file. Just whip over to your document and do your work. Snap back to your spreadsheet, and it's just like you left it.

With up to ten different programs at your fingertips, you'll have instant access to your database, communications, spelling checker, spreadsheet, word processor, RAM resident utilities, languages, anything you like.

Reach deep into expanded memory.

This could be the best reason ever for owning an expanded memory card, like the Intel Above Board, AST RAMpage, or any card compatible with the L/I/M Extended Memory Standard.

Software Carousel puts programs into this "high-end" memory for temporary storage when they're not in use. And switches them back out when you want them. It's fast, efficient, and easy.

If you want, Software Carousel will even use your hard drive for swapping. Just allocate a portion for storage, and go to work.

Sidekick, Superkey and Ready. All at the same time.

You know what happens if you try loading two or more RAM resident utilities at once. You get crashed keyboards, frozen screens, all kinds of interference between programs fighting for control.

With Software Carousel, you can have as many accessories and utilities on-tap as you want. Just load different ones in different Carousel partitions. Since they can't see each other, they can't fight.

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With all this power, you might think Software Carousel is complicated and difficult to use. Not so. Set it up once, and it will remember forever. Better still, Carousel will look for the programs you use most often, and optimize them for the quickest access.

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as common stocks, preferred stocks, corporate bonds municipal bonds, U.S. Treasury bonds and notes, convertible bonds, mutual funds, money market funds, options, warrants, commodities, futures, and other types of securities.

Packages for the individual investor tend to be more limited. In fact, some packages will only let you track stocks. So keep in mind the types of securities that you currently own or plan to invest in when evaluating these packages.

Data entry is usually a straightforward process. For each portfolio and security type, the package prompts you to enter a series of information. For example, for each stock you own, you would typically enter the stock's ticker symbol, company name, purchase date, number of shares purchased, total cost or cost per share, and whether you bought the stock in cash or on margin. Some packages ask you to enter commissions separate from the total cost or cost per share amount to track commission costs. Others lump the commissions in with the total cost or cost per share figure.

Once you have entered your initial holdings, the program will prompt you to enter information each time you purchase or sell a security. For instance, if you sell a stock, the package will ask you for the stock's ticker symbol, number of shares sold, sale date, and total sale price or sale price per share.

If you do not sell all your shares, you would indicate which shares you sold. Assume, for example, that in February 1977 you bought 100 shares of XYZ Corp. for $75 per share and in August 1985 you bought another 100 shares of XYZ Corp. for $150. In December 1985 you decide to sell 100 shares at a price of $125 per share. Most portfolio management software packages can match the 100 shares you sold with either the ones you bought in February 1977 or August 1985. This is important in determining whether there has been a gain or loss on the sale and whether it is short or long term as defined by the Internal Revenue Service for tax purposes.

In this example, if you match the 100 shares sold with those purchased in February 1977, you'll have a long-term gain of $5,000. But if you match the 100 shares sold with those purchased in August 1985, you'll have a short-term loss of $2,500. Thus, your approach to matching sales with purchases can have a significant effect on your income taxes.

You can update your portfolio with current prices in two ways, manually or automatically from an on-line service, such as the Dow Jones News/Retrieval. Most portfolio management packages can retrieve current prices from an on-line service. If you own more than a few securities, automatic updating will save you time and reduce data entry errors.

REPORTS Reports are the most important part of a portfolio management package. They enable you to look at your holdings from various perspectives.

Most packages for individual investors include only predefined and unchangeable report formats. On the other hand, packages for professionals often allow you to create custom reports.

The most common type of report reflects a portfolio's current status. As shown in Figure 1, this report normally lists each security and indicates its type, whether it was purchased in cash or on margin, its name, the number of shares or units owned, purchase price, current price, and gain or loss in both dollars and

PC MAGAZINE EDITOR'S CHOICE

***Advent Software's The Professional Portfolio** is the finest system we've seen. It's fast and stores information on an unlimited number of portfolios. The package also offers many extras, such as appraisal and cash reports, and double-entry accounting. But its $5,200 price tag and steep yearly maintenance fee make it appropriate only for financial institutions.*

***Pinstripe Software's Visible Asset** gives professional brokers a fast way to screen a securities database. It is easy to use, with thorough documentation and offers a wide variety of reports.*

***The Isgur Portfolio System's** low $239.95 price makes this capable package from Batteries Included appropriate for professional and individual investors. Its use of the GEM interface provides flexibility and easy communications among parts of the package. It offers flexible reports and what-if analysis.*

CURRENT PORTFOLIO STATUS
FOR JOE INVETOR
AS OF 12/26/85

PURCH TYPE	INVEST TERM	SECURITY NAME	NO. OF SHARES	PURCHASE PRICE/SHR	CURRENT PRICE/SHR	GAIN/LOSS PER SHR	PERCENT CHANGE
C	LONG	APPLE COMPUTER	100	51.25	21.75	-29.50	-57%
M	SHORT	COMPAQ COMPUTER	250	10.38	12.75	2.38	22%
C	LONG	INT'L BUSINESS MACH	100	60.00	153.25	93.25	155%
B	SHORT	PAC T&T B 8.65% 2005	5	77.50	85.50	8.00	10%

MARGIN ACCOUNT DATA

ACCOUNT % REQ	EQUITY $	% EQUITY	PURCHASING POWER
50	1920.41	72.38	1187.50
30	0.00	0.00	0.00
25	0.00	0.00	0.00

SUMMARY DATA

PORTFOLIO PURCHASE VALUE	17,593.75
PORTFOLIO CURRENT VALUE	24,962.50
TOTAL UNREALIZED GAIN/LOSS	7,368.75
TOTAL UNREALIZED SHORT TERM GAIN/LOSS	993.75
TOTAL UNREALIZED LONG TERM GAIN/LOSS	6,375.00
PURCHASE COMMISSIONS	480.56
SALES COMMISSIONS AND COSTS	203.58
TOTAL COMMISSIONS & COSTS YEAR-TO-DATE	684.14

Figure 1: *The current portfolio status report is the most common type of report.*

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A	CC	AA	DDD	D	E	BB	F	FF	GG	AAA	H	BB	JJ	JJJ	AAA	BBBB

AFTER DISK OPTIMIZING

AAAAAAAAA	BBBBBBBB	CC	DDDD	E	FFF	GG	H	JJJJJ
AAAAAAAAA	BBBBBBBB	CC	DDDD	E	FFF	GG	H	JJJJJ

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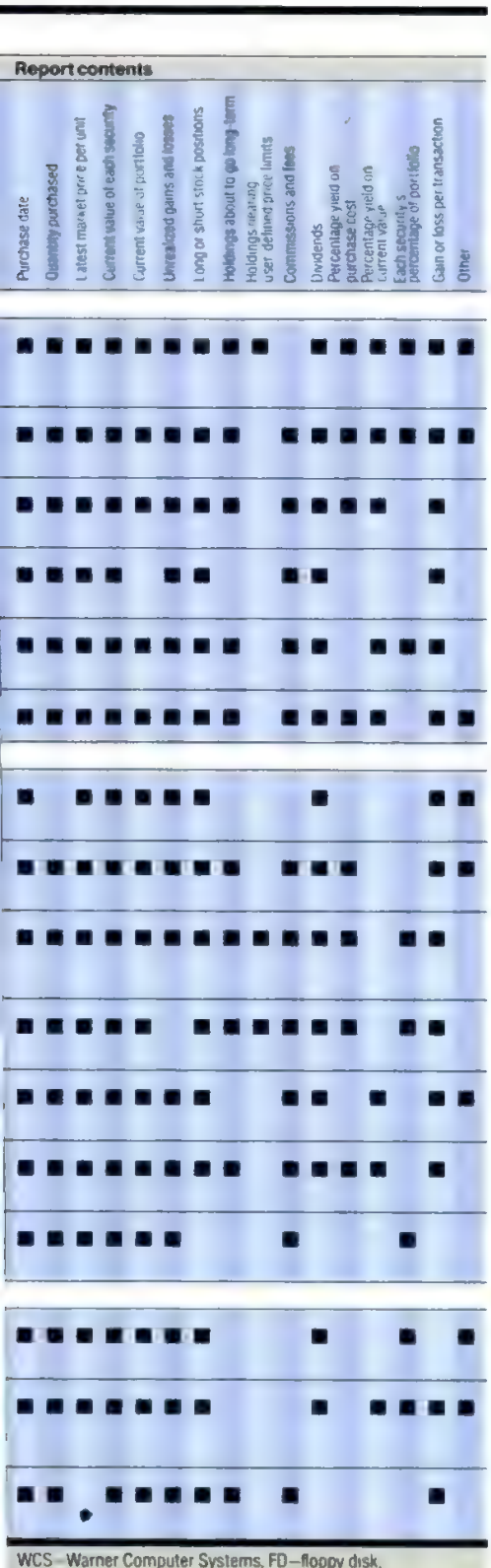
PORTFOLIO MANAGEMENT

PC MAGAZINE

SUMMARY OF FEATURES

Product	Price	Databases accessed	Maximum number of: Portfolios per disk	Securities per portfolio	Transactions per security	Securities maintained: Common stocks	Preferred stocks	Corporate bonds	Municipal bonds	U.S. Treasury bonds and notes	Convertible bonds	Mutual funds	Options	Warrants	Commodities	Futures	Other	Records short sales	Records marginal positions	Securities cross-referenced among portfolios	Price updates applied to all portfolios	Reports generated: Current portfolio status	Cash portfolio status	Dividend/bond interest due	Dividend income	Individual security status	Long-term status	Interest income	Tax year profit and loss	Other	Security description
PROFESSIONAL																															
Broker's Helper, with Prospector's Helper	**$1,595.00**	DJN/R	600	100	100	■	■	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■		■			■	■	■
Client Tell Systems	**$1,000.00**	DJN/R, WCS, CS	*	*	*	■	■	■	■	■		■	■			■	■		■	■	■		■	■	■	■	■	■	■	■	■
Reveal	**$1,550.00**	DJN/R, WCS	*	*	*	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■		■	■	■	■	■	■	■	■	■
Telebroker	**$595.00**	DJN/R, WCS	*	*	*	■		■	■	■		■	■			■	■		■		■		■	■	■	■		■			■
The Professional Portfolio	**$5,200.00**	WCS, IDC	*	*	*	■	■	■	■	■	■	■	■			■	■	■	■	■	■	■	■	■	■	■	■	■	■		■
Visible Asset	**$1,495.00**	DJN/R, WCS	*	*	*	■	■	■	■	■		■	■			■	■		■	■	■		■	■	■	■			■	■	■	■
INDIVIDUAL																															
BluChip Portfolio Manager	**$79.95**	None	1	800+	†	■	■					■	■										■			■				■	■	■
Certified Personal Investor	**$149.00**	None	1	30	150	■	■				■		■										■			■		■		■	■	■
Dow Jones Market Manager PLUS	**$249.00**	DJN/R	26 on FD, 255 on HD	1,002 on FD, 3,530 on HD	26 on FD, 255 on HD	■		■	■	■		■	■			■	■			■	■	■	■		■		■	■	■		■
Net Worth	**$89.95**	DJN/R	*	50 or 100	†	■	■	■		■		■	■	■					■				■	■		■			■	■	■	■
Portfolio Decisions	**$249.00**	DJN/R, CS	1	200	200	■	■			■		■	■	■			■			■	■		■	■		■	■		■	■		
Stock Portfolio System	**$225.00**	DJN/R	*	*	*	■	■	■	■	■		■	■					■	■				■	■	■	■	■	■	■	■		■
STOX/M	**$130.00**	DJN/R, CS, TS	30	150	500	■	■	■	■	■		■	■	■					■	■			■	■						■		■
BOTH																															
Citiquote Investor	**$395.00**	Citishare's mainframe	*	*	N/A	■	■	■	■	■	■	■	■	■					■	■			■	■		■	■				■	■
PEAR Portfolio Management System	**$695.00**	MD/DS	200	500	250 OP, 250 CP, 250 IE	■	■	■	■	■	■	■	■	■					■	■			■	■		■	■	■	■		■	
The Isgur Portfolio System	**$239.95**	DJN/R, TS, CS	*	*	*	■	■	■	■	■	■		■		■				■	■	■	■	■	■	■			■	■		■	

Abbreviations: CS—CompuServe, DJN/R—Dow Jones News/Retrieval, IDC—Interactive Data Corp., MD/DS—Merlin Dial/Data Service, TS—The Source, HD—hard disk, OP—open positions, CP—closed positions, IE—income entries. N/A—Not applicable. *Depends on available space. †Unlimited. ■ means yes.



WCS—Warner Computer Systems, FD—floppy disk.

percent form. Also, current status reports frequently present the total unrealized gain or loss and divide that into short- and long-term components. You can prepare a separate report for each of your portfolios.

A second report contains income tax data. As shown in Figure 2, a tax year profit/loss statement lists the name, number of shares, purchase date, sale date, total cost, total proceeds, and short- and long-term gain or loss for each security you sold during the tax year. This report contains information required by schedule D of your federal income tax return.

Most packages generate a report similar to a portfolio's current status report, that lets you examine all the data for an individual security. As you can see in Figure 3, a typical report contains the purchase date, whether the security was purchased in cash or on margin, number of shares, purchase price per share, total purchase cost, current price per share, total current value, gain or loss per share, total gain or loss, commissions paid, and dividends received. In addition, this report presents data on option holdings.

NAME: JOE INVETOR TAX ID#: 123-45-6789

PROFIT/LOSS STATEMENT
FOR 1985
AS OF 12/26/85

SECURITY NAME	# OF SHARES	PURCH DATE / SELL DATE	TOTAL COST / PROCEEDS	G A I N / L O S S SHORT	LONG
INT'L BUSINESS MACH	100	06/06/82	6,189.28		
		12/19/85	15,425.00	0.00	9,235.72
LOTUS DEVELOPMENT	100	07/26/85	2,996.55		
		12/20/85	2,550.00	-446.55	0.00
			NET GAIN/LOSS	-446.55	9,235.72

NET PROFIT/LOSS(SHORT + LONG) FOR 1985 8,789.17

Figure 2: *A tax year profit/loss statement contains the data required to fill out your schedule D.*

IBM STOCK REPORT
AS OF 12/26/85

PUR DATE	06/06/82	CLOSE DATE	06/13/82
# OF SHRS	100	PURCHASE TYPE	C
PURCH $/SHR	60.00	TOT PUR $	6000.00
CURR $/SHR	153.25	TOT CURR $	15325.00
G/L / SHR	93.25	GAIN/LOSS	9325.00
PURCH COST	80.00	SELL COST	0.00
DIVIDENDS	1460.00	TOTAL G/L	10705.00
----------OPTION WRITTEN----------			
EXPIR DAT	01/17/86	GAIN-OPT.	391.00
OPT. $/SH	155.00	G/L IF EX	9811.00
RET ON INV	177%	AFT TAX G/L	7493.50
AFT TAX ROI	124%		

Figure 3: *The report on an individual security is similar to a portfolio's current status report.*

At last! - Fast, On-screen

FLOWCHARTS

And Organization Charts

Finally! An on-screen flowchart processor that knows about flowcharts and organization charts - not just another "screen draw" program that makes you do most of the work.

Interactive EasyFlow is a powerful full-screen graphics program dedicated to flowcharts and organization charts. With this program you can quickly compose charts on the screen. More important, you can easily modify charts so they are always up to date.

Features: • Text is automatically centered, character by character, within shapes as you type it • Text formatting controls allow you to over-ride the automatic formating where desired • Lines are created by specifying the starting and ending points - the program automatically generates the route • Powerful editing facilities allow shapes and even entire rows and columns of shapes to be inserted or deleted; lines are automatically re-routed as necessary • Large chart size (up to 16 shapes wide by 16 shapes high) allows very large flowcharts and organization charts to be handled with ease • Charts can be larger than the screen - the window into the chart scrolls both horizontally and vertically as necessary • Flexible printer interface allows it to work with all printers, not just dot matrix printers. Wide charts can be printed in strips Also works with Hewlett-Packard 7475A (and compatible) plotters • Twenty standard flowcharting shapes included • Common shapes supplied in three sizes • Extensive manual (125 pages) includes many examples • Context sensitive "help" facility provides immediate assistance at any time • Any number of titles can be placed on a chart • Commentary text blocks can be placed anywhere in the chart • Fast: written in 8088 assembler • Plus many more features than we can mention here.

Requires at least 256K memory, DOS-2 or higher and an IBM or Hercules compatible graphics card.

Order direct for only **$149.95** + $2.00 S&H (USA/Canada), $10.00 (foreign). Payment by MO, check, VISA, COD or Company PO. Rush orders accepted ($15.00 S&H; USA/Canada only). Rush orders received by noon will be delivered the next business day (to most locations).

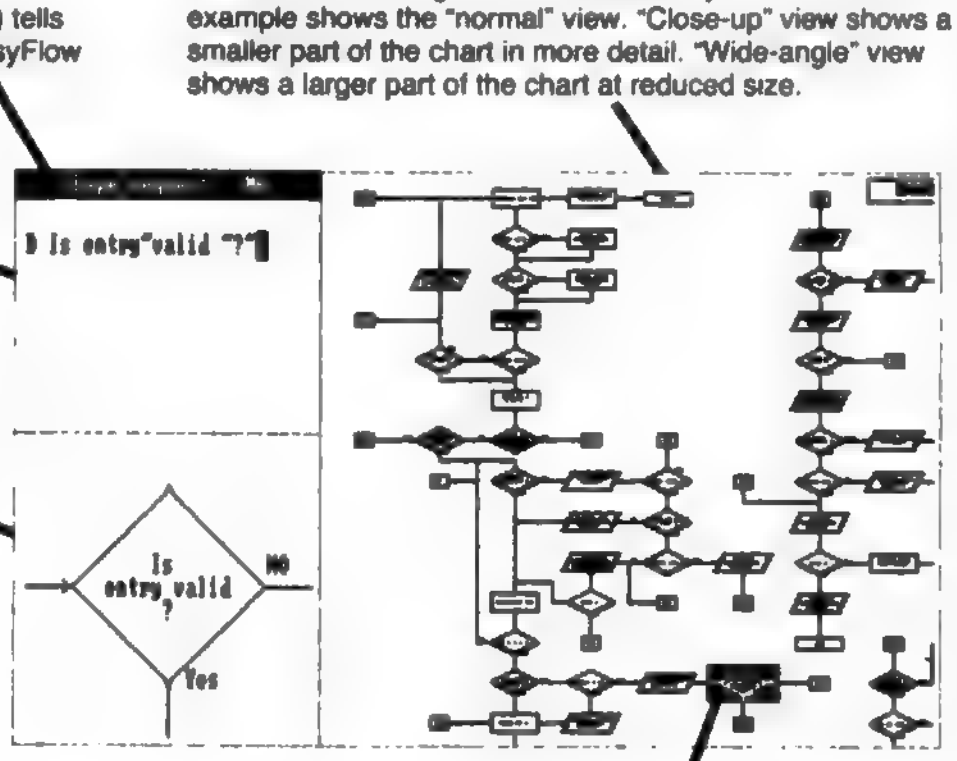
The sample screen display shown below is typical of what you see while editing a chart. Other screen displays are provided for entering titles, changing options, getting "help" and so on.

STATUS BAR (not to be confused with a wet bar) tells you what Interactive EasyFlow is doing at all times.

CHART WINDOW gives an overview of your chart; this example shows the "normal" view. "Close-up" view shows a smaller part of the chart in more detail. "Wide-angle" view shows a larger part of the chart at reduced size.

TEXT/MESSAGE WINDOW used to enter user text and to display messages from Interactive EasyFlow.

CURRENT SHAPE WINDOW - shows the content of the current flowchart shape (the one under the SHAPE CURSOR) in complete detail.



SHAPE CURSOR shows where you are in the chart. Cursor keys move it around; chart window scrolls if you run off the edge of the window.

HavenTree Software Limited
P.O. Box 1093-P
Thousand Island Park, NY 13692
(613) 544-6035 ext 49

CIRCLE 201 ON READER SERVICE CARD

PORTFOLIO MANAGEMENT

Two commonly available reports reflect current income, from both interest and dividend payments. The interest income report presents the interest earned on bonds, money market funds, certificates of deposit, and bank accounts. The dividend income report shows the dividends paid for each stock plus the date of payment. Both reports are prepared on a calendar year basis and are useful for determining income tax liabilities.

Other common reports alert you to future events, such as when a security will go long term as defined by the Internal Revenue Service. This gives you advance warning so that you can adjust your investment strategy to meet your current tax position. Another report identifies dividends and interest due in the near future, helping you ensure that you receive these payments and manage your cash flow better.

Additional reports are unique to professional packages. For example, a security cross-reference list allows professionals to screen through portfolio data and list all clients owning a specific security. This helps them quickly identify clients who might be affected, for instance, by news of the takeover of a company.

Overall, our reviewers found the portfolio management packages to be a mixed bag. Some packages are of little practical value to either individual or professional investors because of limitations in the type of securities they track, the number of portfolios they maintain, and the information they present in reports. Other packages contain capabilities ideal for individual investors but too limited for professionals. Still others have features that will overwhelm most individual investors but are vital to professionals.

In the reviews that follow, our reviewers discuss the pros and cons of each package. Addressing both individual and professional investors, they highlight key features. With the reviews to guide you, you should be able to find a package for your particular needs.

The opinions expressed in the reviews that follow are those of the individual reviewers; they do not represent the views of Shearson Lehman Brothers.

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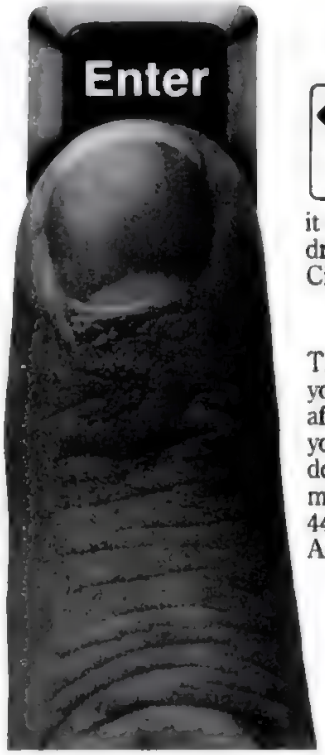
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CIRCLE 526 ON READER SERVICE CARD

BLUCHIP PORTFOLIO MANAGER



Xor Corp.'s *BluChip Portfolio Manager* is an inexpensive and easy-to-use first portfolio management package. It will track your current stock holdings and simple cash transactions and generate reports on the profits and losses from real or hypothetical trades.

To get you up and running quickly, *BluChip* comes with a slender 14-page manual that clearly instructs you in operating the program on a hard or floppy disk system. To install the system, you simply copy three files from DOS onto the working disk provided in the package. The manual even includes year-end procedures for archiving old trades on disks and creating new files for the coming year. The software is not copy protected.

BluChip comes with a hypothetical portfolio comprising 20 purchases, 15 sales, and a cash dividend payment to show you what completed records look like. While the package runs on a monochrome monitor with a standard monochrome adapter, the records are very pretty when viewed on a color display. The program's color screens are vivid red, blue, green, yellow, and white.

SIMPLISTIC SETUP The program is easy to use but also simplistic and limited. You can store only one portfolio per disk. And each record in the portfolio is held discretely. *BluChip* does not consolidate data from various purchases of the same stock. Thus, for example, an active investor who on seven occasions bought 100 shares of IBM would wind up with seven records in his portfolio named IBM. If the investor wanted to sell his entire IBM position of 700 shares, he would have to enter seven sell records against each purchase rather than entering one sell for 700 shares. Moreover, if an investor wanted to adjust the current price of his IBM position, he would have to manually change the price of each individual lot.

To add a purchase record to the portfolio, you press F1. The program then creates a blank record that prompts you to enter a maximum of 13 pieces of data, such as the name of the stock, the ticker symbol, the brokerage firm, the broker's name, whether the stock record is tax deferred, the date of purchase, the number of shares purchased, price per share, commission, miscellaneous charges, interest, SEC/postage costs, and a one-line note on the trade. While *BluChip* will not record a short sale (of something you don't own) in a sell record, you can record the sale in a purchase record by using the Minus sign key and designating the number of shares and the selling price.

To process a sell, you would first call up the purchase record for the stock being sold and then press F2. The program brings up a form listing the name of the stock and its purchase date. You enter the sale date, number of shares, selling price, commission, miscellaneous charge, interest, and SEC/postage fee. If you did not liquidate the entire position, the system will then update the purchase record to reflect the amount of shares you have left, the estimated net price, the estimated value, and the estimated profit or loss on the position based on its net price. Also, the details of the sell records are transferred to the original purchase record and listed in a two-line horizontal window below the note line.

If you want to test your intuition with various new issues or stocks listed on markets with which you're not familiar, you would record these sales on separate disks. The manual suggests that you keep a disk for hypothetical purchases, another for speculative new issues, and, perhaps, a third disk for miscellaneous hunches.

In addition to the normal buy/sell functions, *BluChip* will track dividends received and recalculate the value of a position after a stock split. However, if you record a split in a record that has previous sales listed, the package erases that sell information.

EASY DATA ENTRY Although *BluChip* is restricted, entering the data is quite easy. The command menu that runs horizontally along the bottom of the screen lets you get help, find a record by stock name, change the price of a record, access reports, record cash dividends, and stock splits. To execute these commands, you either place the cursor on top of the command desired and press the Enter key or you press the first letter of the command. The program also uses a combination of five function keys, the Plus/Minus sign keys, the Cursor Up/Down arrows, and the Enter key. Each time you make an entry with the Enter or Cursor Down key, the cursor moves to the next position on the record. You can also use the Plus and Minus sign keys to enter values.

If you make a mistake, *BluChip* flashes error messages in red and suggests alternatives. And if you get into trouble working on a purchase or sale record, you simply call up the help menu, which will display the function key commands pertinent to the given situation. You can execute these commands directly from the help screen.

BluChip generates only two reports. The "sales analysis and dividend" report shows you the stocks sold, the purchase date, sale date, year-to-date dividend payments, and whether the gain or loss is short or long term. Unfortunately, this report does not show the number of shares sold, the purchase price, or the selling price. You have to go back to stock's the purchase/sale record to see this information.

The "estimated portfolio value and gain/loss analysis" report displays each holding individually with the purchase date, the number of shares remaining, the estimated net price, value, and gain/loss. Thus, from our previous example, you would see seven entries for 100 shares of

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BluChip Portfolio Manager
Xor Corp.
5421 Opportunity Court
Minnetonka, MN 55343
(800) 635-2425
(612) 938-0005 (in Minn.)

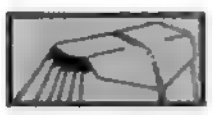
List Price: $79.95
Requires: 128K RAM, one double-sided disk drive, DOS 1.1 or later.
In Short: An inexpensive, easy-to-use, but limited, first portfolio management package for the individual investor.

CIRCLE 694 ON READER SERVICE CARD

IBM at different values had you not adjusted the market price of each position. Haplessly, this report does not tell you the price you paid for the shares owned.

BluChip is not suited for the serious investor with multiple portfolios and a variety of securities. It could, however, be useful to the private investor who wants to learn to manage his own portfolio on a PC and is willing to put up with the package's limitations.—**Marie Dockery**

BROKER'S HELPER WITH PROSPECTOR'S HELPER



"The first (and only) software package designed to support all of the activities of a broker, and, therefore, to significantly increase your earnings." That's how North American Software Inc. defines its *Broker's Helper*. And if that statement doesn't whet your appetite, the manufacturer further states that the package "may well be the most important productivity improvement tool since the telephone."

However, there are indications that these claims should be taken with a grain of salt: At a base list price of $1,595, *Broker's Helper* resides on eight double-sided diskettes. The package has 300 pages of documentation and a hardware security device. Also, the version we tested required a minimum of 640K bytes of memory. Data entry can be exhausting, and the number of accounts that the program can handle is limited.

FUNCTIONS AND FEATURES On the plus side, *Broker's Helper* is a powerful program designed for the broker who wants an interactive, on-line program that can be used during trading hours. It handles a myriad of functions like dialing clients, automatically adjusting for stock distributions as well as changing money rates and margin requirements to fit your structure, adjusting to any specified capital-gains holding period when required, capturing preset commission structures, and searching client files on the basis of your criteria in as many ways as you specify.

Distinctive program features include performing automatic price updates through Dow Jones News/Retrieval coupled with the ability to set price alerts and review research updates for securities. *Broker's Helper* also enables you to project what-if analyses during a portfolio review to determine the effect of a series of possible trades on all aspects of the portfolio through a window. A useful aspect of this feature is being able to see both the before and after analyses without affecting the permanent files. The package can also perform a variety of calculations, such as compound IRA/Keogh growth rates, tax-free bond comparisons versus taxable equivalents, bond yields and valuations, rates of return on securities, and convertible security evaluations.

INSTALLATION AND DATA ENTRY Here's the minus side: If you decide to try the program, make sure you let the manufacturer know how much memory you have available. We spent more than an hour trying to break the barriers of the insufficient memory message even though we followed the manual's installation and getting started procedures verbatim.

Finally, after three unsuccessful attempts to gain access, we called the manufacturer, who informed us that 512K bytes were not enough memory to run the beta version. The manufacturer recommends using a hard disk with 640K, even though there are versions that require 512K bytes and a hard disk, or 640K bytes and two floppy disks.

Once the program is installed, it begins by requesting data entries for the current money fund interest rate and current call money rates. The same screen advises you of how many price alerts are active and the date of the last automatic security price update. Leaving this screen takes you into the master menu, which comprises eight selections that disguise the detailed, entry-packed submenus in each selection.

Data entry is intended to be quick, since you use the function keys to execute commands. But with the excessive amount of details the program requests, entering the data can be an exhausting effort. For instance, aside from the expected information on date, quantity, description, and price that you need to enter a trade, *Broker's Helper* asks you to (1) enter P, E, D, or C to indicate Pending, Execute, Delete, or Cancel entry, (2) enter O or C for Open/Close position, (3) enter, from a list of 13 possibilities displayed on a submenu, the type of product (for example, SX for short sale of stock, PS for early maturity bond, and so forth), (4) give the broker's discount on commission, and (5) add the reference number for deletion of a previous entry. Even with the F4 option key, which serves somewhat as a Help function by displaying a list of options and explanations for the type of entry expected, the average new user will need at least 2 to 3 weeks, if not longer, to become familiar with the codes.

One of the program's major drawbacks is the fact that it is limited to handling 600 accounts and 1,500 securities. You can't exceed these specifications with year-end procedures. The manufacturer can supply a utility disk that will archive historical trades, but it offers no way to supplement the securities file. An active user could easily exceed these limits in less than a year. Surprisingly, *Broker's Helper* also neglects to offer such features as calendar reminders and comments on transactions.

DOCUMENTATION The version of *Broker's Helper* that we tested resided on three double-sided diskettes and required 512K bytes of memory. The manual accompanying the software described program and memory specifications, but did not mention that different configurations are available. This omission is not serious in itself, but *Broker's Helper* has been tailored to suit smaller environments than 640K bytes since the documentation was written. A new user would not be aware of these enhancements because the early, generic documentation is shipped with the product.

Also, there are discrepancies between the documentation and the different versions of the software itself. Granted, the pitfalls amount to less than a handful, but a new user with little or no knowledge about computers and DOS could easily become frustrated enough—particularly with the confusing start-up command instructions—to warrant not using the software. The manufacturer admits that some of its

literature is unclear about the different versions available and suggests that users discuss their specific needs and their machine's memory limitations with a company representative before purchasing the program.

As its name implies, *Broker's Helper* is designed to serve the broker as a right-hand helper; it is meant to be used interactively on-line during trading hours. Because of its on-line design, using this complex system at home or away from the office is not recommended. In your office, consider using *Broker's Helper* only if you have the time and/or an assistant to help you load the data and the patience to learn what makes the program increase your productivity.

PROSPECTOR'S HELPER *Prospector's Helper* from North American Software Inc. is designed to be used solely for prospecting and handling client contact. The vendor plans to offer it as an enhancement to *Broker's Helper* in the future, as well as continuing to offer it as a standalone product. This well-designed prospecting tool helps you maintain current client information such as name, address, interests, financial status, relational contacts, and much more. It also allows you to keep time-frame logs, comments, and reminders for each client/prospect.

Prospector's Helper also has some unique, interesting features like prospect calling, which allows you to call all prospects within a selected list one by one. After you have completed your first call, you press a few keys to proceed to the next one alphabetically and auto-dial that number. Other handy features are call reminders, logs, and comments. If you keep personal or business-related information on clients or wish to develop additional clients, *Prospector's Helper* can help.—**Marie Dockery and Louis Pantoliano**

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Broker's Helper
North American Software Inc.
4140 Crossgate Dr.
Cincinnati, OH 45236
(513) 793-2240
List Price: $1,595 (includes *Prospector's Helper; Prospector's Helper* alone costs $195)
Requires: 512K RAM, hard disk recommended, printer capable of printing 132 cols., modem, color graphics, DOS 2.1 or later.
In Short: A complex system for interactive, online use. Designed for professional stockbrokers who are experienced computer users. The major drawbacks are the limitations on the number of accounts and the total number of securities it can handle.

CIRCLE 651 ON READER SERVICE CARD

CERTIFIED PERSONAL INVESTOR



The *Certified Personal Investor* from Progressive Peripherals & Software is a simple-to-use, inexpensive—but limited—package for the home investor.

CPI's strongest points are its ease of use and its Stockcalc investment analyzer module that allows you to perform simple what-if calculations. Even these strengths, unfortunately, have their weaknesses.

While the package is basically easy to use, for example, novices might have trouble installing the package on a hard disk because the manual neglects to include hard disk installation instructions. Instead, the manual suggests that you look at your DOS manual.

Once *CPI* is installed, the tutorial does a nice job of teaching you how to use the package. The tutorial consists of keystroke-by-keystroke instructions in the manual that lead you through *CPI*'s data-entry and reporting functions. You use these instructions to fill in sample data-entry screens and reports that are on-disk. These sample screens look like the real thing, but data entered into them does not affect the rest of your portfolio.

CPI's menu-driven structure is also easy to follow. On-screen instructions lead the way even for the most inexperienced users. For example, to select a menu option, you move your cursor to the desired function and press Return. *CPI* actually has an on-screen message telling you to

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use the Cursor up or down key to move the cursor to the menu item you want. If you hit the wrong key, an error message appears telling you that you gave the incorrect response.

The on-screen help menu is also a nice tool. When you press the question mark key, the help function provides a short explanation of what you're doing wrong as well as a page number in the manual where you can find a more detailed explanation. But there's a catch: many of the pages are misnumbered or, after page 68, not numbered at all. Luckily, functions relating to stocks are listed alphabetically.

INVESTMENT ANALYZER Stockcalc, *CPI*'s investment analyzer, lets you do simple spreadsheetlike analysis and projections for planning an investment strategy. *CPI* gives you five columns for performing these calculations. In the rows you can either input a number or perform a calculation on the input. You could use the analyzer to calculate earnings per share, or you could calculate the price you'd have to sell your stock shares for to make a 10 percent profit—all pretty basic stuff.

The rest of *CPI*'s features are equally basic. It lets you track a single portfolio, comprised of up to 30 stocks and options. You can record 150 transactions per security. The package only handles stocks and options; those who have bonds, funds, or other types of investments will have to turn elsewhere.

You update your portfolio manually with current prices. *CPI* creates a limited number of reports, including summary reports of realized and unrealized gains and losses. *CPI*'s reports sort securities alphabetically, by date of purchase or sale date. In addition, *CPI* includes reports of long- and short-term gains and losses and dividend income, which are necessary for tax-accounting purposes.

If you have a limited portfolio of stocks and options and want to get your feet wet in computerized portfolio management with an easy-to-use package, consider *Certified Personal Investor*.

—Michael A. Kahn

PC MAGAZINE FACT FILE



Certified Personal Investor
Progressive Peripherals & Software
464 Kalamath St.
Denver, CO 80204
(303) 825-4144
List Price: $149

Requires: 128K RAM, one single-sided disk drive, DOS 1.1 or later.
In Short: An easy-to-use package for those with a limited portfolio of stocks and options.

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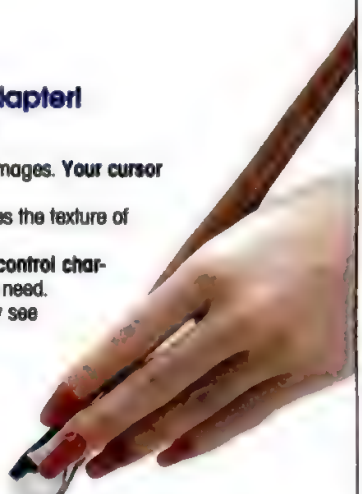
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For technical information call:
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CITIQUOTE INVESTOR



Citishare's *Citiquote Investor* is targeted at the professional broker who maintains and evaluates a large number of securities portfolios. This unusual product consists primarily of a bare-bones portfolio editor coupled with a link to Citishare's DECsystem 20 mainframe computer, where 5 years of data on 50,000 issues is stored.

The program, which is not copy protected, comes on a single floppy disk, accompanied by a registration card and Remote Computing agreement that must be sent in to Citishare to obtain a user ID and password. Because it operates only as a terminal for Citishare's mainframe, *Citiquote Investor* also requires a Hayes 1200-baud Smartmodem. The user's manual includes switch settings for an external modem; I used the Hayes 1200B internal modem, configured as COM1, without difficulty. The manual provides adequate step-by-step instructions, but includes no tutorial, glossary, index, or even concrete examples of use. The manual's terse and technical language reminds me of IBM's documentation, except that IBM's manuals are scrupulously complete.

Installation is simple; you copy the disk onto your hard disk using the DOS COPY command.

DIF CONVERSION UTILITY *Citiquote Investor* can be used to price and evaluate portfolios and retrieve large quantities of detailed information about the securities in the portfolio at the same time. You can also use it to search for securities that meet your particular criteria. A convenient utility included in the package converts any of *Citiquote Investor*'s four portfolio reports to a DIF-format file for input into a spreadsheet program like *1-2-3*.

Once you have entered your user ID and password into the program, you select the Portfolio Manager from the main menu, and then select Create a Portfolio from the next menu. After you enter a portfolio name of up to 10 characters, *Citiquote* prompts you through a lengthy list of the data available on Citishare's mainframe, allowing you to choose which items to retrieve for this portfolio.

This list is divided into three sections: master data, which contains performance information about the securities (name, description, earnings per share, beta, coupon, maturity date, yield, and so on); pricing data, which allows you to select any or all of high, low, or closing prices and vol-

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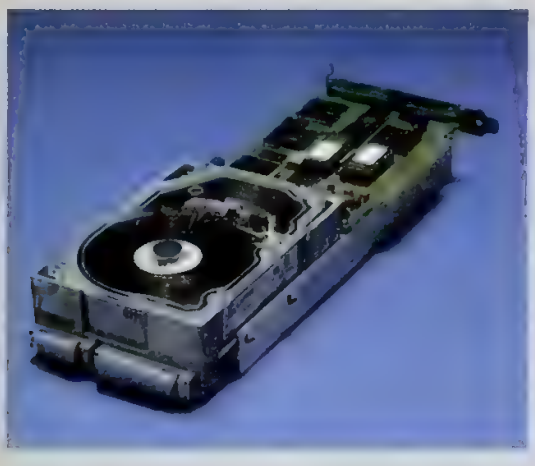
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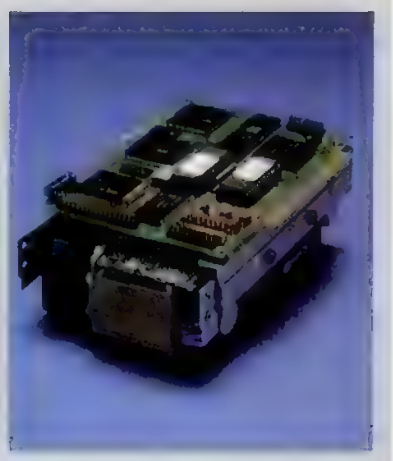
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PORTFOLIO MANAGEMENT

ume for any dates within the last 5 years; and dividend data, which allows you to select ex-dividend date, payment date, date of record, and rate for a consecutive series of dividends within the date range you specify.

Once you have selected the data you'd like to retrieve, you insert your current open positions. For each position, you enter only the ticker symbol, number of units, date of purchase, and unit purchase price. When all current positions have been entered, you press Escape and return to the Portfolio Manager menu.

MAINFRAME-BASED UPDATES If you select Update a Portfolio from the main menu, *Citiquote Investor* will present you with a list of portfolio names on your data disk so that you can type in the name of the portfolio you wish to update. The program then dials up the Citishare DEC-system 20 mainframe, retrieves the information you have specified for that portfolio, and places it in four disk files that correspond to the program's four available reports. When the data has been downloaded, the program automatically disconnects from the mainframe and returns to the Portfolio Manager menu.

Now you can view any of these reports on the screen, print them, or convert them to DIF files. Although these reports are sufficient for personal use, they are not really well-formatted enough for a professional to hand to a big client.

The master data report presents all the selected performance information about the securities in the portfolio. But, since the record for each security runs over onto three lines, as does the column heading line at the top, it's fairly hard to reach and match columns at the same time with the report on-screen. Citishare says that with a wide-carriage printer, however, the lines on the printed reports run across one line rather than three and the columns are easier to read. The pricing data report (from the pricing data you entered for this portfolio) and dividend data reports (from the dividend data requested) are cleaner, listing the information you have requested across the page by symbol and date.

The evaluation report is adequate, listing symbol, shares, purchase and current prices, current value, unrealized gain/loss

as both a percentage and a dollar amount, and the percentage of the portfolio's value that each position represents. The evaluation report doesn't include the security name or description and makes no provision for a disclaimer, an element a professional broker would certainly require.

To use *Citiquote Investor* to winnow securities by particular criteria, you follow a similar procedure to that for creating reports. You must first create a "portfolio" to hold the search results, then choose Ticker Selection from the Portfolio Manager menu. You may then type in selection ranges for any of the 20 security characteristics that the program presents on your screen, including P/E ratio, shares outstanding, capitalization, Moody's and S&P 500's ratings, coupon, maturity date, and so on. *Citiquote Investor* will then retrieve the first 100 ticker symbols it finds meeting your criteria.

ACCESS TO CITISHARE For the record, *Citiquote Investor* has a couple of other unique functions. One is the ability to transfer your disk files onto the Citishare mainframe and subsequently retrieve them, although the usefulness of this feature is questionable. It might be useful for those with limited disk storage space. The other interesting feature is a main menu option called Terminal to Citishare, which has your computer dial up to the main-

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Citiquote Investor
Citishare Corp.
399 Park Ave., 2d fl., zone 10
New York, NY 10043
(212) 559-0372 (in N.Y.)
(800) 241-2476

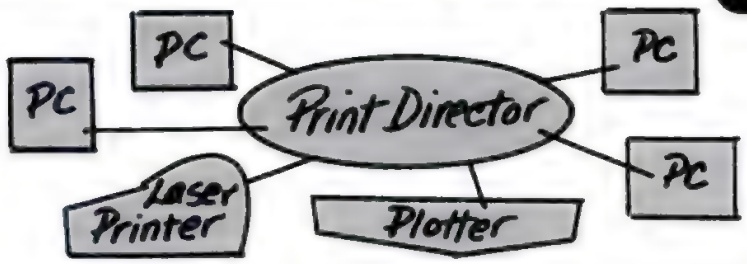
List Price: $395

Requires: 128K RAM (320K RAM if using a hard disk), two double-sided disk drives, modem, DOS 2.0 or later; printer recommended.

In Short: A bare-bones portfolio editor with limited reports; of use to only the dedicated, computer-savvy individual investor rather than the professional

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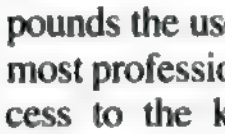
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frame and receive the DECsystem 20's "at" sign system prompt. The documentation says that this mode gives you "access to all other Citishare financial services," but what those might be and how you really access them are not described.

What this program is designed to do, it does reasonably well at a reasonable price. However, I have difficulty imagining who might use it. *Citiquote Investor* cannot store transactions. As the program stands, if you wish to change portfolios to reflect purchases and sales, you must calculate the current position manually, then page through the program's list of update criteria (just like creating a new portfolio—no shortcuts) until you get to the position you want to change. This unsophisticated user interface is time consuming for professional brokers, and assumes that they already have true portfolio management systems to keep track of current open positions.

The lack of an on-line help facility compounds the user-interface problems. Also, most professional brokers already have access to the kind of data on Citishare's mainframe through their in-house quote systems (although they might use *Citiquote Investor* to get similar information at home). On the other hand, individual investors might find access to Citishare's vast securities database valuable if, for instance, they are regular clients of a discount brokerage firm. My caveat here is that *Citiquote Investor*'s bare-bones manual and less-than-friendly interface suggest that the personal investor who uses it have more than casual experience with both personal computers and the business of brokerage.—**Loren Amsden**

CLIENT TELL SYSTEMS



The professional broker must not only keep tabs on who owns what at what value, he or she must also solicit and prospect by mail and phone, keep track of these contacts, and report to management as well as to the client. With capabilities that extend beyond portfolio tracking, *Client Tell Systems* from William C. Pavlick Inc. is a large, relatively expensive ($1,000 plus) package that represents a serious and well-reasoned attempt to meet all of these needs. It succeeds amazingly well.

The system comes on seven disks containing more than 60 files; although the minimum system requirement is 128K bytes and two double-sided floppy drives, you should seriously consider a hard disk and 256K bytes to get the most out of this system. Installing the system on a hard disk is as simple as creating a subdirectory and using the DOS COPY command to transfer all the files into it.

A DATABASE APPLICATION Portfolio management is essentially a database application. *Client Tell* is composed of a collection of database files into which the broker enters information. This database includes files on securities, transactions, the needs and interests of leads and existing clients, records of telephone conversations, and a file that keeps track of several brokers' clients and transactions simultaneously. *Client Tell*'s many reports are constructed out of data from one or more of these files.

Client Tell's 337-page manual contains a sparse, 28-page tutorial that walks you through the process of entering into the database information for a single client and security and transaction information for one stock and one bond. It then shows you how to print three reports. Unfortunately, most of the package's functions are not covered in the tutorial. The rest of the manual is devoted to explaining each menu selection in the package in the order in which it appears on the main data entry and reporting menus. Its lack of an index is frustrating, but on the whole the manual is complete and clearly written.

Client Tell's main menu is deceptively short: you type D to enter data or R to run reports. *Client Tell*'s wealth of options becomes apparent, however, once you access the 17-item data-entry menu or the 25-item reporting menu.

Essentially, the data-entry menu lets you view, change, or enter information about clients or leads. One of the menu options, for example, lets you define up to 20 numeric codes in order to keep track of your clients' interests, occupations, investment preferences, or other characteristics. The data-entry menu also helps you keep track of historical trade data (in order to generate tax reports) and current transactions, including buying, selling, receiving, delivering, shorting, and shorting against the box. While you can enter data about securities traded, you must categorize the security as one of 12 types, including stocks, bonds or fund, options, assets, or liabilities.

While you are entering data into a client's or prospect's file, you can access a submenu at the bottom of your screen that allows you to print a mailing label with a single keystroke. If you have an autodial modem, this submenu allows you to dial either of two telephone numbers by pressing a single key. Once you have the client on the phone, you can enter *Client Tell*'s log file to set up a tickler file entry, which stores messages of up to 50 characters, describing the conversation and action to be taken. It can also print reminders to you on a specified date.

If you have an autodial modem, you can choose a data-entry menu option that will dial into your Warner Communications account to retrieve price, dividend, maturity date, and coupon information about the securities that you have entered. *Client Tell* also accesses CompuServe and Dow Jones News/Retrieval, but Pavlick strongly recommends using Warner and includes it as the default pricing service.

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Client Tell Systems
William C. Pavlick Inc.
310 Belmont Ave.
West Hempstead, NY
11552
(516) 485-2865
List Price: $1,000 (plus $200 optional annual update/support subscription)
Requires: 128K RAM (256K RAM recommended), two double-sided disk drives, DOS 1.1 or later.
In Short: Though neither fast nor pretty to look at, this package is a comprehensive tool for the professional broker.

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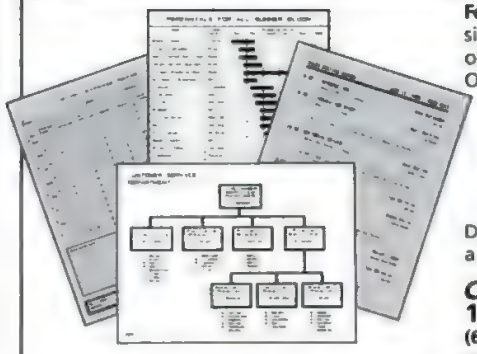
STANDARD AND CUSTOMIZED REPORTS The reporting menu allows you to get all your information out of the system in a usable form. You can choose to call reports up to your screen or print them. *Client Tell* has preformatted reports, but it lets you design custom reports as well. You type in column headings and select the contents of each column from a lengthy menu that includes everything in the database about a given security or position or that the program can calculate about it. Also, reports may be converted into a DIF file for use with *1-2-3*.

Preformatted portfolio reports include appraisals, realized gain/loss reports for tax purposes, a comprehensive balance sheet, and a sophisticated income report with a column for every month of the year and a row for each security a client owns that will pay a dividend or generate interest. You can also print out reports of the tickler/log file and contact lists of clients or leads. You can be very selective when generating a contact list; *Client Tell* allows you to make your selection by any type of information on the client/lead record, for example, by interest codes or products, and will allow you to do Boolean "or" and "and" searches. This package will even automatically dial the phone numbers of the contact list it generates one after another. However, the phone-dialing menu can't "hang up"; I had to unplug my modem at the end of each dialing session.

Names and addresses selected from the client/lead database can be printed directly on one-across or two-across mailing labels. *Client Tell* will also convert your mailing list into an ASCII file format and inserts certain merge codes so that it can be imported into *WordStar* or *MultiMate* for creating form letters.

Client Tell is neither blindingly fast nor pretty to look at. Written in Microsoft COBOL, its screens and menus are bland and in some cases crowded. If you need to search a large client file for people who meet multiple criteria, you may as well go get some coffee. This slow speed isn't unusual for programs of this size and complexity and won't hamper *Client Tell*'s use by an individual broker. *Client Tell* will store several brokers' records, but it's not fast enough to keep up with more than a single professional's business.

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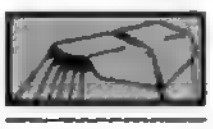
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Nonetheless, if you are looking for a comprehensive productivity tool for the professional account executive, this package deserves your serious consideration.—**Loren Amsden**

DOW JONES MARKET MANAGER PLUS



Dow Jones Market Manager PLUS, written by Teleware Inc., and marketed and supported by Dow Jones, is a non-DOS investment program (it runs on the UCSD p-System) targeted for serious individual investors. It gives individuals advantages available to professionals: near-real-time pricing information and late-breaking financial news.

FEATURES Dow Jones has integrated its Dow Jones News/Retrieval and stock quote service databases into *Market Manager PLUS*, turning your personal computer into an "investor workstation." This facility enables you to move easily and quickly between managing your holdings and analyzing fast-breaking news that may affect their market value.

Before you venture into the myriad financial and business databases Dow Jones offers, you must obtain a password. The password (normally $75) is free to purchasers of *Market Manager PLUS*. Use of the databases costs 90 cents per minute during prime time (6 a.m. to 6 p.m. EST) and 20 cents per minute during nonprime time (6 p.m. to 4 a.m. EST).

Market Manager PLUS includes several features not commonly found in other portfolio management packages. The program will alert you when the price of a stock has gone below or above a previously set limit. It allows you to handle cash transactions, and it will automatically credit or debit the cash balance, depending on the transaction. It will also categorize dividend and interest income according to how it will be taxed (federal, state, municipal, and so forth).

From a strictly bookkeeping perspective, *Market Manager PLUS* is excellent. It gives you such essential accounting information about your portfolios as realized and unrealized gains and losses, current cash balance, commissions paid, and, as I mentioned, a breakdown of taxable and nontaxable interest earned.

USING THE PROGRAM The program's documentation is attractive, clearly written, and very well organized. It starts you off with an installation procedure that is easy to follow but takes some time (possibly several hours) if your entire hard disk is partitioned for DOS. Since *Market Man-*

Network Your PC For Only $79.95

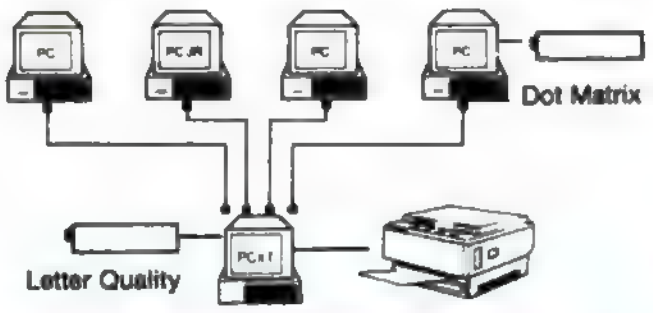
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			Amount
2 PC Network		$159.90	_____
3 PC Network		$239.95	_____
Additional PC's	@	$79.95 ea.	_____
2 Port Board		$219.95	_____
30' Cable		$49.95 Qty.____	_____
		TOTAL ORDER	_____

Server Technology, Inc., 1095 E. Duane Ave. Suite 107, Sunnyvale, CA 94086, Telex 5106003481

In Canada, GK Industries 514-694-7676
In England, Tashkl Computer Ltd 040-231 423

CIRCLE 520 ON READER SERVICE CARD

ager PLUS is written for the UCSD p-System (a non-DOS operating system), you'll have to back up your entire hard disk, remove the DOS partition, create new partitions for DOS and the p-System, and restore your DOS files before you can install *Market Manager PLUS*.

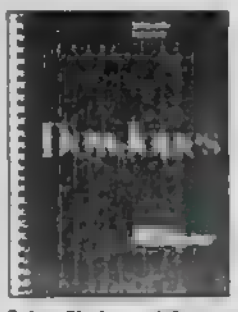
The manual then takes you through a brief tutorial with a sample session that is not included on the disk. The program revolves around a well-designed main menu that uses function keys F1 through F10 to move you from task to task. You can become quite proficient in using the system in a short time without having to consult the manual too frequently.

DRAWBACKS Where *Market Manager PLUS* falls short, however, is in its ability to do portfolio analysis. The system does not give you, for example, a breakdown of product-type percentages (what percentage of the portfolio is in options, what percentage in municipal bonds, and so forth), nor does it allow you to categorize your holdings by industry (automotive, computer, medical, or others, for example). In addition, gain and loss are presented in its reports only as dollar values, not as percentage increases and decreases (which are useful when you're comparing your portfolio's performance with that of the Standard & Poor's 500 Index or the Dow Jones industrial average).

Another minus for *Market Manager PLUS* is its non-DOS operating system; the program does not include a facility for moving your portfolio data into a DOS-based spreadsheet like *1-2-3* or *Multiplan* to do what-if manipulation or other analyses.

As a portfolio analysis package, *Market Manager PLUS* is flawed, and using it can involve costly on-line connection charges. But despite these drawbacks, *Market Manager PLUS* has a number of commendable features. More importantly, it can help the individual investor who is actively trading get the up-to-the-minute information necessary to make investment decisions in today's rapidly changing financial marketplace.—**Jack Weingarten**

PC MAGAZINE FACT FILE



Dow Jones Market Manager PLUS
Dow Jones & Co.
P.O. Box 300
Princeton, NJ 08540
(800) 257-5114; in N.J. or Canada, call (609) 452-1511

List Price: $249 plus database charges
Requires: 128K RAM, one double-sided disk drive; modem and printer recommended.
In Short: A well-rounded investment tool for the serious individual investor who wants up-to-the-minute financial information, falls short, however, when it comes to portfolio analysis

CIRCLE **635** ON READER SERVICE CARD

NET WORTH



The developers of *Net Worth* seem to have gone out of their way to produce an inexpensive, nicely thought out portfolio management package for the individual investor. *Net Worth* is not a system without problems, but given the price, you might choose to live with them.

FEATURES *Net Worth* is designed for the individual investor with a small number of portfolios to manage. The program enables you to maintain common stocks, preferred stocks, corporate bonds, municipal bonds, U.S. Treasury bonds and notes, mutual funds, options, and commodities in a portfolio. You can also use it to help you handle assets and liabilities other than securities, like real-estate investments and auto loans. *Net Worth* offers up-to-date portfolio status and income tax information for time intervals you select. Using a modem and the Dow Jones News/Retrieval service, you may automatically update security prices. Although it's not an analysis package, *Net Worth* also allows you to track some historical data for stocks—up to a year's worth. You can track price highs and lows for a security, flagging those that exceed a value you specify.

INSTALLATION AND DATA ENTRY *Net Worth* comes on two disks, and the software includes some fairly foolproof batch files to install the system on a hard or floppy disk. The system seems to be written in compiled BASIC; it includes a standard IBM license agreement, apparently for use of the BASRUN.EXE file.

When I installed *Net Worth*, I found myself looking at a pleasing logo and menu screen; a nice feature is built-in help screens for each main menu item that appear when you press the Question mark key. I wish some better-known software companies would follow *Net Worth*'s lead in this respect.

Net Worth prompts you to enter the standard data like security name, date of purchase, quantity, purchase price, and so forth. Data entry, while simple, can sometimes be slow and confusing. Sometimes you end an operation with the F10 key and sometimes with the Escape key. You're apt to be confused at first, until you get to know *Net Worth*'s idiosyncrasies. The program often requires you to know the physical record number of a lot if you wish to close by lot. Should you fail to give a correct answer for the record number, you must enter the item again; it would be nice if the program presented you with a list of the relevant lots and allowed you to choose.

GRAPHS AND REPORTS Once you've entered trading data and current prices either manually or automatically via Dow Jones News/Retrieval, you may produce graphs and reports. The reports include current portfolio status, cash portfolio status, dividend/bond interest due, dividend income, individual security status, long-term status, interest income, tax year profit/loss, and buy and sell orders.

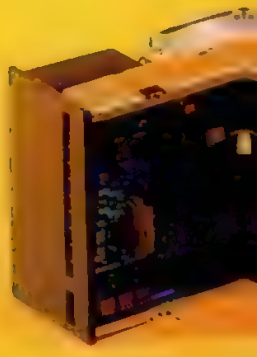
The report system allows you to route various portfolio reports to the printer or the screen. One of the program's nicer touches is that you can page up or down through up to 16 pages of a report on-screen so that you don't have to print it out each time you want to review it.

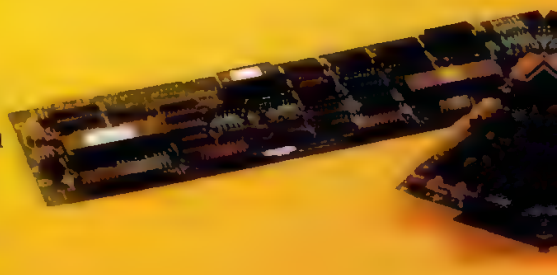
The screen graphs are well executed. The representations of stock volume and pricing are clear; volume is shown in a vertical bar graph, for example, and stock prices have bracket-type notations. Dates are given at the bottom for handy reference.

A tutorial in the back of the user manual

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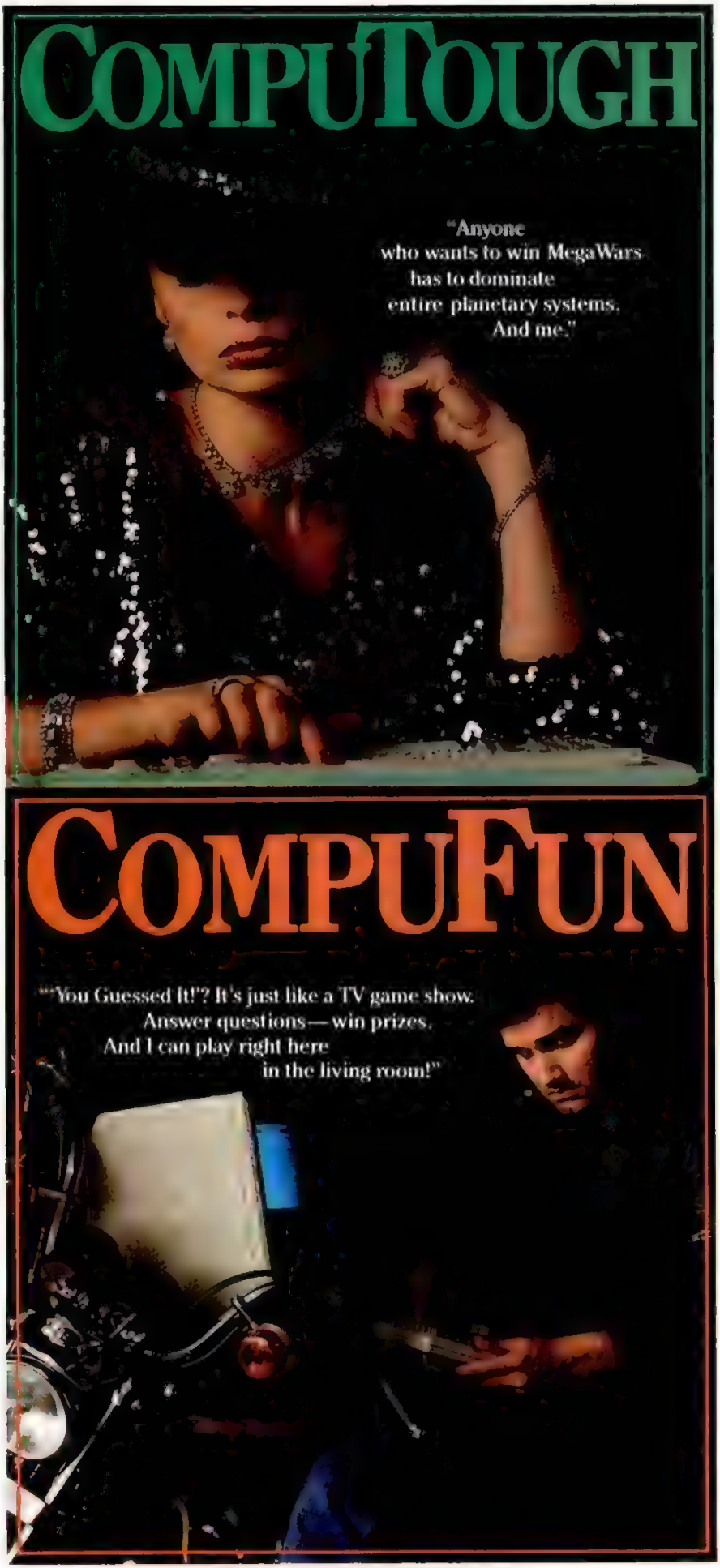
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walks you through a typical session of data entry and portfolio reporting/graphing. *Net Worth* could be much improved by a better manual, however; the current one is poorly organized and in need of a comprehensive index. The manual also lacks a list of error and informational messages and conditions for both *Net Worth* and BASIC. And if you find that the manual doesn't answer your questions, telephone support is available only between 5 and 7 p.m., central daylight time. The otherwise hard-to-use manual does have a few nice touches like a complete record description for its files, for those who needed to write interfaces to the data files.

IN SUM On the whole, *Net Worth* struck me as a mixed bag. Certain functions are so well thought out that they border on brilliance; other functions seem to be unnecessarily awkward.

I question a couple of basic premises, like a separate disk file for each security held by an account; on a floppy disk system, it's very easy to exceed the number of allowed directory entries on the disk. You might need separate floppies if you hold a large number of different securities in a portfolio.

On the other hand, I liked the price, the batch files that automatically installed *Net Worth* in its own subdirectory, and the online help files available for each of the functions. These assets must be weighed,

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***Net Worth* (Deluxe Edition) Version 2.3**
Bullish Investment Software
P.O. Box 853
Mansfield, TX 76063
(817) 473-9249

List Price: $89.95
Requires: 256K RAM, two double-sided disk drives (hard disk recommended), DOS 2.0 or later; modem and printer recommended.
In Short: A flawed yet inexpensive portfolio manager for the individual investor; nice reports and graphics balance out some of its problems.

CIRCLE 639 ON READER SERVICE CARD

however, against its clumsy data entry; if you plan on using Dow Jones News/Retrieval for price updates, you may save yourself some aggravation. While *Net Worth* may be a trifle awkward in places and perhaps a little on the slow side, given its nice reports and graphics, it's a fair-to-middling system for the money.
—**Neil Rossi**

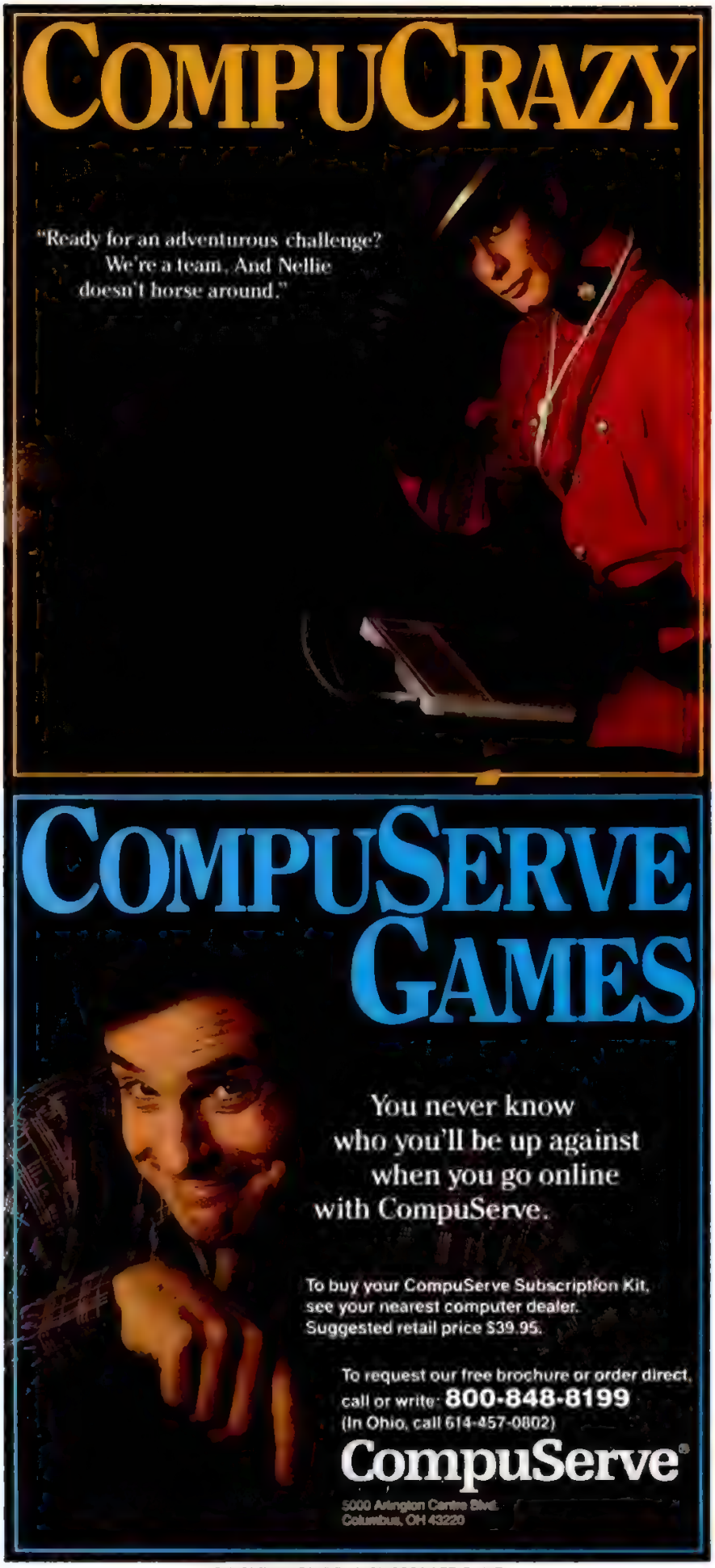
PEAR PORTFOLIO MANAGEMENT SYSTEM



Hale Systems Inc.'s *PEAR Portfolio Management System* is a relatively small package geared to the individual investor or to the new broker entering the business. It is primarily an easy-to-use, "meat-and-potatoes" package that offers the usual "posting" journal for keeping track of securities bought and sold; it generates reports such as Appraisal, Unrealized and Realized G/L, Income Details, and Security Cross References. However, *PEAR* also serves up such nouvelle cuisine as a daily-entry log report, a system for tracking your shares in a stock split, and an all-in-one method for setting up a portfolio and entering data.

The relatively easy-to-use main menu is logically ordered the way you would expect to use the system. It begins with the Portfolio Positions and Security File Manager, which lead you to various submenus that let you set up portfolios and keep track of securities bought and sold as well as their prices. You then move on to options that allow you to generate reports, back up files, and exit the system.

SETTING UP A PORTFOLIO From the main menu you can use two different procedures for setting up a portfolio and entering data into *PEAR*'s database of securities. Using the data-entry procedure common to most portfolio management packages, you first choose the File Manager option to enter the information pertinent to the security, then go to the Portfolio Positions menu and either select an existing portfolio or create a new account. You



CIRCLE 226 ON READER SERVICE CARD

then enter the transaction for the security and the account established.

The second procedure, however, is unique and the fastest, easiest way to use the program. You select Buy or Sell from the Portfolio Positions menu, which automatically lands you in the subsequent menus necessary to set up an account with positions. When you designate the portfolio ID number, the program applies all trades entered to that account until you specify otherwise when you return to the Portfolio Positions menu.

The second item on the main menu, Security File Manager, gives you flexibility and speed in manually or automatically pricing securities for the entire database or for a single portfolio. When you choose to price a single portfolio, the program will bring up only the securities in that account; you can either manually enter the new prices or use the automatic pricing feature. I was very impressed by how little time it took me (about 25 minutes) to establish a portfolio containing ten positions, even without reading the entire manual.

PEAR requires a Hayes Smartmodem in order to access the Merlin Dial/Data service for current prices on stocks, options, and bonds. Merlin Dial/Data is quite inexpensive (from 4 cents to 25 cents per issue retrieved each business day in a month), and it also offers as much as 23 years' worth of historical prices for technical analysis. An appendix to the manual describes how you can create symbols that are compatible with the pricing service for stocks and options, but it makes no reference to bonds.

TRACKING FRACTIONAL SHARES

An interesting feature is *PEAR*'s stock split routine, which lets you account for fractional shares in a split. If you choose to keep track of fractional shares, the program will display each portfolio containing the security, and you choose whether to buy or sell the fraction. *PEAR* then prints old and new positions so you have a dated record of the portfolios affected and the position adjustments due to the stock split. However, it's not so easy to load data for fixed income and dividend positions that require you to enter annual dividend rates in whole numbers with decimal fractions. You can enter percentages, such as interest rates for money market funds, only as decimals; for example, 0.125 percent rather than 12.5 percent.

The manual is organized with a table of contents, glossary, and troubleshooting guide. Unlike most programs' manuals, the majority of its 114 pages are devoted to giving you step-by-step, detailed instructions for each menu prompt. You must read it to operate the system effectively.

PEAR's drawbacks diminish the value of its unique features. The package says that it is "designed to be used by stockbrokers and other professional investors." Unfortunately, the system's inability to address the broker's daily functions of making telephone contacts, keeping a calendar, prospecting, mass mailing, and handling system growth (the disk storage capacity is 200 portfolios with 500 securities) makes it less cost-effective.

Moreover, after your 90-day warranty period has expired, you will have to pay an annual fee of $150 for extended technical support and updates. And even though the program is relatively expensive ($695, including $40 for the demo), it is limited to stocks, fixed-income products, liquid assets, and options (buy/sell only).

If cost is not a concern for you, however, the *PEAR* portfolio management package does offer simplicity in automating your books, although without a time management function.—**Marie Dockery**

PC MAGAZINE FACT FILE



PEAR Portfolio Management System
Hale Systems Inc.
Remote Computing Division
1044 Northern Blvd.
Roslyn, NY 11576
(516) 484-4545
List Price: $695
Requires: DOS 1.1 or later, 192K RAM, two double-sided drives.
In Short: Most useful for the individual investor, *PEAR* offers all the usual portfolio management tools plus it tracks shares in a stock split and offers an all-in-one method for setting up a portfolio and entering data.
CIRCLE 887 ON READER SERVICE CARD

PORTFOLIO DECISIONS



Portfolio Decisions from Silver Eagle Software is for the serious personal investor. It can track a sophisticated portfolio of stocks, mutual funds, bonds, options, Treasury bills, Treasury warrants, and certificates of deposit.

For $249, this menu-driven package allows you to keep a single portfolio consisting of 200 securities, with a maximum of 200 transactions per security.

Recording a purchase or sale or performing some other operation on your portfolio is relatively straightforward. From the main menu, you select the Portfolio Index option, which lists all the securities in your portfolio along with their ticker symbols and type (stock, bond, option, etc.). Each screen presents nine securities, and you can easily add new ones.

To update information on individual securities in your portfolio, you call up a screen containing a summary of information on the security with a single keystroke. The summaries, which are customized for each security type, would show such information as current shares and average cost per share for a stock, for example. At the bottom of this summary screen is a menu that allows you to examine records of all purchases, dividends, sales, or stock splits for that security and add new data if you like.

Portfolio Decisions's report generator offers such standard reports as current portfolio status, dividend interest due, dividend income, interest income, and long-term tax status. You can also use it to generate two forecasting reports. The Tickler report keeps you up to date on what's due to happen in your portfolio; for example, it shows expiration dates for warrants, options, and maturing Treasury bills. The Monthly Income Forecast projects your monthly income based on the frequency of previous payments from all income-producing securities in the portfolio.

To update prices in your portfolio, you can automatically dial CompuServe or Dow Jones News/Retrieval from the main menu. The package comes with a compli-

mentary subscription to CompuServe. *Portfolio Decisions* is preconfigured for a 300-baud modem. To use a 1200-baud modem, you'll have to learn the configuration process because *Portfolio Decisions* comes with no instructions for doing so.

Once you've completed your update, the downloaded prices flash across the menu like those on a stock ticker. However, these prices are not up to the minute, they are only the last ones downloaded.

Portfolio Decisions also has a built-in terminal emulator that allows you to dial into and use a variety of database services.

MANUAL FLAWS Although this package has a respectable complement of features, you have to work for them. The program is difficult to set up, due primarily to incorrect installation instructions in the manual. Unfortunately the manual was written for a non-copy-protected package, while the one received for review was copy protected. Hard disk users must keep a key disk in drive A:—a fact that the manual neglects to point out. The vendor claims that an insert with that information will be included for new purchasers.

The manual includes a short tutorial that takes you step by step through demonstration data. It also includes examples of most reports and data entry fields as well as detailed descriptions of each report item and of each field. Unfortunately, the manual does not adequately describe each program function, and the package's help function is of little value.

Portfolio Decisions offers some advanced features for the personal investor, but the manual and the help function will have to be improved before you will be able to use the package without great difficulty.—**Michael A. Kahn**

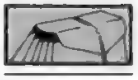
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***Portfolio Decisions*, Version 2.0**
Silver Eagle Software
P O Box 278
Franklin, OH 45005
(513) 746-1395
List Price: $249
Requires: 128K RAM, two double-sided disk drives or one double-sided disk drive with a hard disk, DOS 1.1 or later.
In Short: Offers a good range of sophisticated features for the individual investor, but is difficult to use.

CIRCLE 685 ON READER SERVICE CARD

REVEAL



Reveal is a full-service portfolio management package that can help stockbrokers manage a wide variety of securities for clients. In addition, *Reveal* produces many useful reports.

In fact, the reports alone make *Reveal* worth its $1,550 price. They track all manner of transactions involving stocks, bonds, convertible bonds, funds, options, commodities, Ginnie Maes, annuities, tax shelters, money market funds, and foreign exchange trades, among others. You can use these reports as a sales tool to demonstrate the value of your advice to clients.

With the realized gain loss report, for example, you can show clients how much profit your strategy has made them. The chronological detail report lists all of the client's trading activity and keeps a running cash balance for a specific time period. You can use it to show your client the effect of all the portfolio transactions on the amount originally invested. For a look at the amount of money spent building a portfolio versus the amount of the original capital remaining in the account, you can run an inventory/cash flow report.

The Schedule D report helps clients and their accountants report capital gains and losses to the IRS. The appraisal detail and summary reports help you identify securities that can be sold at a profit and those that can be sold at a loss. The income detail and summary reports help you decide whether the portfolio is meeting a client's long-term income requirements. The accrued interest report gives your client up-to-date information on how much interest would result from selling a particular fixed-income security. And the trades report can help you explain corporate statements to your clients.

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portfolio. Using this information, you can create a strategy to diversify a client's portfolio and identify stocks that have significantly moved up or down in price. You can display reports on the screen, print them out, or transfer them into a spreadsheet.

CLIENT AND PRODUCT FILES *Reveal*'s powerful database allows you to keep files on all your clients and screen them in a variety of ways that will help you prospect for new clients or serve existing clients better. You can, for example, screen the database for clients who have a specified net worth or income level, who desire certain levels of realized gain and loss, live in a particular state, or have a certain ZIP code, You can also screen by money market fund, interests, occupation, tax bracket, and positions in a particular stock. You can call up detailed information on any particular client's portfolio.

The program can automatically dial your client's telephone number using your Hayes-compatible modem, leaving the client information on the screen for referral during the conversation.

The client reports function helps you produce lists of clients by name, account number, suitability requirements, or product holdings. You can use this function to create a name and address file, then transfer that file to a word processor and merge it with a letter. If you want to send a client an update on the performance of a particular stock, use *Reveal*'s note function.

The product file holds such securities data as a security symbol, security number, exchange, buy/sell, product type, earnings, dividend, expiration date, pay date, annual dividend, type of industry, product group, transaction date, quantity bought, and yield. You can also easily define industry and product groups. Using the products menu to scan existing products, you enter new products, define your own product groups, and calculate bond yield-to-maturity and price.

You enter all transactions through the Enter Transaction option. You can record sales on a FIFO or LIFO basis, or by specific lot. *Reveal* displays all existing lots, so you can choose the lot you want to sell. This is useful for keeping track of long- and short-term holdings for tax purposes. You can also record short sales. To scan and correct information about trades or remove trades from the database, you choose from the "correct trades" menu.

UP AND RUNNING Hard disk installation is simple. The install program creates its own subdirectory where *Reveal*'s programs and your data can reside. Installation on a floppy disk system is more involved. In order to use *Reveal* you must make backup copies of the program disk.

You enter and access client, product, and transaction information through a series of easy to follow menus. The startup menu lets you change your system date, exit to DOS, enter maintenance mode, or proceed to your main menu choices.

The main menu allows you to maintain your client and product files, enter transactions for those clients, produce client and portfolio reports, and manually or automatically update prices.

The 195-page manual has good explanations and examples of essential functions and commands. It includes an index, glossary, explanations of error messages, and samples of applications, screen displays, and printed output.

DRAWBACKS *Reveal* has a few minor drawbacks. The format of the portfolio reports could use some improvement, as could the calculations. Not all pages in the reports have headings, nor are they all numbered. Blocks of information are awkwardly split across two pages. Final total cost figures on the Schedule D reports do not line up under the total cost column. The inventory/cash report would be more useful if it started with an opening balance.

Although the package could be a tad more sensitive to detail, *Reveal* can save you time, help you market more effectively and efficiently, and give you an edge over the competition with its portfolio reports. Overall, *Reveal* is a very good package.—**Patricia Levin**

PC MAGAZINE FACT FILE



Reveal
Reveal Software Inc.
155 Mineola Ave.
Roslyn Heights, NY 11577
(516) 621-0700
List Price: $1,550.
Rentals are available at $395 for 6 months; $695 for 1 year.
Requires: 256K RAM, two double-sided disk drives, DOS 2.0 or later.
In Short: A good, full-service package for professional investors, *Reveal* offers especially useful reports.

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STOCK PORTFOLIO SYSTEM



The *Stock Portfolio System (SPS)* by Smith Micro Software is intended for the individual investor tracking a portfolio who does a lot of margin accounting. While *SPS* offers valuable reports not found in many portfolio management systems, it either lacks some basics, like tax lot accounting, or handles them poorly. *SPS* is totally menu-driven, but the data-entry routines are clumsy and amateurish.

PROS The program offers many unique features. Its historical-quotes function lets you select any one of four dates previously saved and then to review your portfolio with that date's prices. This lets you see how your portfolio has grown over time. You can also use it to store your year-end

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Stock Portfolio System
Smith Micro
Software Inc.
P.O. Box 7137
Huntington Beach, CA
92615
(714) 964-0412
List Price: $225
Requires: 256K RAM, one double-sided disk drive, DOS 2.0 or later.
In Short: *Stock Portfolio System* offers many unique and valuable features but falls short on some of the basics. Data entry is also difficult.

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portfolio, then call it up when it's time to fill out your Schedule D tax report. The current portfolio report furnishes detailed information on margin status.

The package allows you to access Dow Jones News/Retrieval for current prices and move into DJ terminal mode through the main menu. Also, you can reprice your portfolio via Dow Jones's 15-minute delayed quote service. *SPS* lets you fine-tune your portfolio accounting by keeping track not only of the purchase date, but also of the settlement date.

CONS Where *Stock Portfolio System* falls short is in the basics of portfolio management and in ease of data entry. The procedure for selling short is to "buy" a negative number of shares. While this method of bookkeeping for short positions is acceptable, it is neither intuitive nor elegant. The current portfolio status report lacks critical information such as purchase date and the total number of shares for multiple positions in the same symbol.

SPS also handles the sell transaction poorly. If your portfolio has several open positions for a specific symbol, *SPS* does not display the open positions. Nevertheless, the package requires you to specify the position you are selling against.

Entering the data is cumbersome and frustrating. You cannot edit any of the fields until you have completed the entire screen. And once you've entered the data, the package has no way to double-check on the data other than by telling you that the month cannot be greater than "12."

When you enter a buy transaction, you must enter the company description each time, even if a position for that symbol already exists. In addition, *SPS* will not verify that the descriptions you enter for the same symbol are identical.

While installation is straightforward, the documentation is just fair. The 60-page manual does have a sample portfolio, samples of screen displays, and samples of printed output, but it is difficult to use because it lacks an index.

In summary, *Stock Portfolio System* offers many valuable reports not common to other portfolio management systems, but they lack some critical information. In addition, *SPS* makes data entry unnecessarily difficult.—**Jack Weingarten**

STOX/M



STOX/M, from Sydney Development Corp. is a portfolio management program that will keep track of up to 30 portfolios for you. The program can maintain common stocks, preferred stocks, corporate bonds, municipal bonds, U.S. Treasury bonds and notes, mutual funds, options, warrants, and rights in a portfolio. The maximum number of securities it can handle per portfolio is 150, the maximum number of transactions per security, 500.

Most new users will find this package easy to use. Entering transaction data for each portfolio is straightforward, and reports, which can be printed to either the screen or a printer, are fairly simple to generate from the portfolio information. Some functions, however, such as performance measurement and pricing control, take time to understand fully.

USING THE PROGRAM The menu-driven program uses a tree-structured main menu, with submenus connected to each function. Every menu is in a horizontal format; you execute functions by highlighting your choice with the cursor keys and hitting Enter.

Once you set up portfolios, the program prompts you for data. It requests the symbol, description, and classification of each security; the transaction date; the quantity bought; and the total purchase price or sell value. To obtain that data, *STOX/M* accesses three on-line databases for price updates: Dow Jones News/Retrieval, CompuServe, and The Source.

UNIQUE FEATURES The *STOX/M* package has a few unusual features for tracking portfolios and transactions. One, the "event list," shows you any security that is going from short to long term or any options that are about to expire.

Another unusual and helpful feature is "performance measurement," which uses graphs and reports to illustrate how a portfolio has performed over a period of time. The graphing part breaks down each portfolio monthly starting from the beginning of the fiscal year. You can then compare the current month to previous months to see how well the portfolio is doing.

The report function does basically the same thing, but instead of a graph, you can see the performance measurement in numerical format. The program generates current portfolio status reports, cash portfolio status reports, and tax year profit/loss reports. Both the graphs and reports are attractive and easy to read.

DOCUMENTATION AND SUPPORT The 130-page *STOX/M* manual gives you a fair description and step-by-step instructions for each function of the program. Although the package has no tutorial disk or manual, it does give you sample data on the disks to practice with. Telephone support is available weekdays from 9 to 5 California time.

SUMMARY *STOX/M* is a fairly inexpensive way to get adequate portfolio tracking. The program has a few unusual features, and becoming familiar with using them is fairly easy. Nonprofessionals with more than one portfolio may benefit from *STOX/M*, but it really doesn't have much to offer the experienced professional. If you really cannot spend three to four times as much for a sophisticated portfolio manager, *STOX/M* will at least allow you to do the basics with 30 portfolios and up to 150 transactions per portfolio. And maybe it could be a way for you to see whether PC portfolio tracking will work for you.
—**Louis Pantoliano**

PC MAGAZINE FACT FILE



STOX/M
Sydney Development Corp.
600-1385 W. 8th Ave.
Vancouver,
British Columbia
Canada V6H 3V9
(604) 734-8822
List Price: $130

Requires: 256K RAM, one double-sided disk drive, DOS 2.0 or later; modem and printer recommended.
In Short: A reasonably priced portfolio-tracking system offering adequate management for up to 30 portfolios.

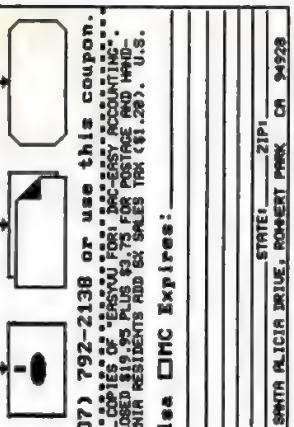
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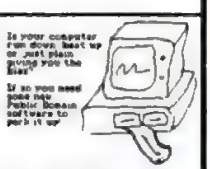
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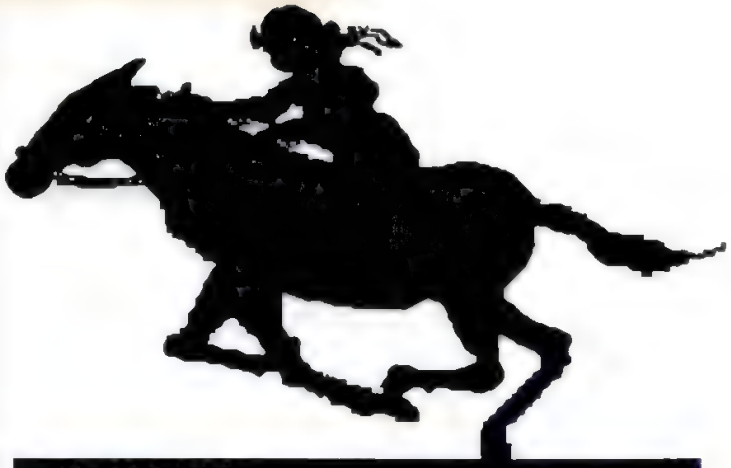


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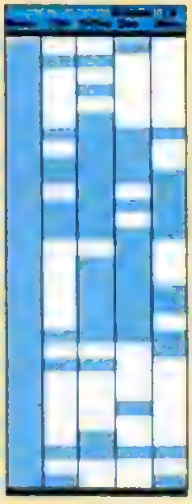
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- User selection of activation key
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- Mass file copy, delete
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- Multiple file sorts
- Display directories
- Alter file attributes
- Change default directory
- Display disk space
- View text files
- Set printer control codes
- Pop-up windows
- Display directory using file masks
- Single-key commands
- Create/remove directories
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- Rename directories
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TELEBROKER



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The *Telebroker* system is a memory-resident RAMdisk database, which makes it quite speedy, but as with all RAM disks, power losses can wipe out all recent additions and changes to the database.

FEATURES *Telebroker*'s master menu allows a number of standard and not-so-standard operations: portfolio maintenance, data retrieval and display, report generation, and security pricing/updating.

Further, a built-in communications utility allows you to access either Dow Jones News/Retrieval or Warner Computer Systems. You may retrieve and save news stories, get current price quotes by sending a list of the desired symbols, or act as a terminal to access any of the other features available on the DJN/R.

The "personalized letters" utility allows you to create a mail-merge file that works with *MultiMate*. This feature will let you extract names, addresses, account balances, number of shares, cash equivalences, and so forth for accounts that hold certain securities and/or satisfy up to five selection criteria, as specified in an 8-character field in the account master file.

PORTFOLIO MANAGEMENT The meat of *Telebroker* is the well-thought-out portfolio management system. *Telebroker*'s developers have paid attention to making the system easy to use without being intrusive. The well-designed screens offer good field validation.

Adding a new account is quick and straightforward. The only annoying feature when adding new data is that you can't move back to a previous field to correct an error; you must continue to the end of the screen and specify the field number.

INSTALLATION *Telebroker* is written under the NCI implementation of Soft-Tech's UCSD p-System. Part of your hard disk must be allocated to a non-DOS partition. If your hard disk is entirely allocated to DOS, you must back up all subdirectories, remove and reallocate a smaller DOS partition, and then use the easy *Telebroker* installation procedure to create the *Telebroker* partition.

Creating and allocating the data files apparently does not initialize them; you initialize files by choosing the appropriate item on the utilities menu. Allocating the files sends you back to the main menu, where you may choose to run *Telebroker*. The process allows you to initialize fewer client, transaction, security, or other records than you have allocated; this feature, in theory, lets you partition as much space as you will need for future expansion, while you avoid loading in all those presently unused records when you boot up.

Telebroker seems to assume that you will remember the maximum values you assigned during installation; it never shows them to you again. You must be sure to make a permanent record of the values for subsequent use. You must also specify the decimal accuracy that will be used in the database. It affects all quantity and amount fields, such as unit price, gain/loss, value, commission, cash balance, and others. You may specify from zero to three decimal places; the higher the decimal accuracy, the smaller the total value capable of being held in that field. For example, a quantity field may hold up to seven significant digits. Specifying zero decimals allows you to buy or sell in lots up to 9,999,999 (just under 10 million) units; with three decimals, the accuracy allows lots up to 9,999.999 (just under 10 thousand) units. You may change the accuracy at any time, but going from higher- to lower-decimal accuracy can cause information loss through errors in rounding.

REPORTS The system generates a number of useful and well-formatted reports, including open position summary and detail, securities and cash transactions, realized gains and losses, priced and unpriced securities, and commissions.

One feature *Telebroker* lacks is the ability to route all its reports to the screen; you cannot view the name and address report, for example, without printing it out. Also, *Telebroker* does not let you view page by page the output of reports that you can route to the screen (for example, the account transaction details); instead it scrolls the lines slowly down the screen. Although you cannot page backward to view the previous page, you can pause a display by typing Ctrl-S.

DOCUMENTATION *Telebroker*'s documentation, about 200 well-written pages in a large binder, is better than average. The manual thoughtfully includes sample data-entry forms that you may copy and use to make your keypunching easier. The organization of the manual could stand some improvement, though, particularly when describing the installation. It mentions the fact that *Telebroker* is a non-DOS system only briefly, with little discussion of the ramifications.

IN SUM *Telebroker* is a mid-priced, better-than-average portfolio management system. It's fairly flexible, with certain minor restrictions in data entry and report generation. With a few enhancements—larger description fields, search-by-name capability, 80-column screen and print reports, and reorganized installation procedures in the manual, for example—it could be an excellent system.—**Neil Rossi**

PC MAGAZINE FACT FILE



Telebroker
Teleware Inc.
The Rotunda
22 Hill Rd.
Parsippany, NJ 07054
(201) 334-1154
List Price: $595
Requires: 256K RAM (more recommended), hard disk drive, DOS 2.1 or later.
In Short: A memory-based RAMdisk database offering a better-than-average, reasonably priced portfolio management system that also produces some helpful reports.

CIRCLE 652 ON READER SERVICE CARD

★ EDITOR'S CHOICE

THE ISGUR PORTFOLIO SYSTEM



The Isgur Portfolio System from Batteries Included is the portfolio management arm of a series of packages called Integral Solutions (I*S). Like all I*S packages, *The Isgur Portfolio System* uses the Graphics Environment Management (GEM) system created by Digital Research Inc. GEM gives you a graphics interface that allows for both program flexibility and easy communications among parts of the package.

FUNCTIONS AND FEATURES With its low $239.95 price and its many helpful functions, *The Isgur Portfolio System* can benefit both individual investors and stockbrokers who manage medium-to-large portfolios. You can keep track of numerous portfolios, securities, and transactions (limited only by your available storage space) and various cash and margin account data, along with some handy information about products (such as high, low, year-end, high alert, and low alert).

The program's GEM interface and I*S Bridge enable you to access a calendar memo and alert function, automatically price securities for portfolio appraisal reports, and access I*S Talk for full telecommunications capabilities (such as an auto log-in phone directory, Xmodem protocol transfers, filtering of input and output, and editing functions that include a built-in spelling checker).

The drop-down menu choices and windows make *The Isgur Portfolio System* fairly easy to use. The program's screens display commands prominently. As a new user you must be willing, however, to put in a fair amount of time to grasp all the capabilities of the system so as to derive maximum benefit from it.

REPORTS Available reports include Portfolio Review, Security Holdings by Portfolio, Realized Gains and Losses, Graph Values (which creates a bar graph that compares security data in various ways), and Graph Diversification (which includes a pie chart illustrating product diversity in a portfolio). The reports offer great flexibility, such as giving you the option to show gain as a percentage or dollar amount and to pull up reports for one portfolio or a group of portfolios.

The Suppose feature allows you to perform what-if unrealized-gain hypotheses in the Portfolio Review. Automatic currency conversion is also available, and you

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can show long, short, or all positions. You can also generate a Cash and Margin Report. And you can account for stock splits and dividends, using either a percentage or a ratio for splits.

INSTALLATION To invoke the necessary graphics interface, you must go through an installation routine that customizes the software to your hardware. The program presents the procedure clearly, offering question-and-answer choices and asking for verification.

DOCUMENTATION Batteries Included tried to make the package simple enough to use without requiring excessive reference to the manual. It's simple enough when you're using the basics of the system, such as buying and selling securities, producing printed reports, updating prices, and reviewing portfolio information. But I had a hard time getting to the real meat of the package—using I*S Bridge and I*S Talk to full advantage.

The tutorial should walk you through the I*S Bridge Memo function to get reminders on positions going short- to long-term, option expiration dates, and bond maturity dates. Although autopricing through I*S Talk seemed easy enough, that part of the program offered many other, more complex features, such as the use of shortcut macro keys, access to DOS functions, and transfer of information among disk files, modem, printer, screen, and memory buffer.

The documentation gives two sets of directions for each procedure described in the manual—one for users with a mouse and one for users with a keyboard only. However, these are lumped together in a way that is somewhat distracting; separate instructions for each would be clearer.

The help screens, available throughout the program, offer some insight on each program function and are cross-referenced to the user's manual.

RIGHT DIRECTION This new program is a positive step in the direction toward truly integrated computing. The developers obviously consulted extensively with a stockbroker who knows his business, since the program accommodates almost every kind of journal entry possible in the brokerage business.

One of *Isgur*'s authors told me that Batteries Included is planning future enhancements, such as a word processing interface and the ability to define client interests and other details pertinent to developing a selective sales and marketing campaign using a PC. True integration with word processing, spreadsheets, and other software would greatly enhance this capable portfolio management system.—**Nancy Gill**

PC MAGAZINE FACT FILE



The Isgur Portfolio System
Batteries Included
30 Mural St.
Richmond Hill, Ontario
L4B 1B5, Canada
(416) 881-9814
List Price: $239.95
Requires: 512K RAM, two double-sided disk drives, DOS 2.1 or later.
In Short: A capable portfolio management system that uses the GEM interface and accommodates almost every kind of brokerage journal entry; could overwhelm nontechnical stockbrokers.

CIRCLE 683 ON READER SERVICE CARD

★ EDITOR'S CHOICE

THE PROFESSIONAL PORTFOLIO



Ever since bank deregulation, brokerage firms have expanded to offer financial-planning advice and services on everything from stocks, bonds, and options to certificates of deposit and tax shelters. *The Professional Portfolio* by Advent Software is an excellent tool for this new breed of high-volume fund managers who need to keep track of investments in stocks and money-market instruments and maintain many securities and transactions for their clients.

The main purpose of the program is to automate the tedious task of keeping the books necessary for complying with the Securities and Exchange Commission requirements for fund managers. In addition, *The Professional Portfolio* produces numerous useful reports for clients and fund managers who use the program. Since the software can store records on an unlimited number of portfolios, several money managers can use the system for multiple clients.

The Professional Portfolio's list price is a sky-high $5,200 ($4,000 for the licensing fee, $1,200 for the first-year maintenance, and $600 for each succeeding-year maintenance, which includes support and product updates). It does, however, include many "extras" such as appraisal reports, interest/dividend reports, cash reports, and so forth. The package also greatly simplifies such tedious and time-consuming reports as commission statements, performance evaluations, registers of all clients, and overviews of client assets by performing all necessary calculations and eliminating the need to enter each piece of data more than once.

FILTERING CLIENTS One of the highlights of the package is its filtering capability. Filtering allows you to screen for clients who meet certain criteria, such as interests, income, stock preferences, and so forth. After screening, the package either prints a list of the selected clients or sends the list to a file. You can then create personalized letters using an ASCII-compatible word processor. The filtering capability is currently accessible only to users who have a text editor or word processor. Advent Software, however, is working to simplify the filtering feature.

Another particularly useful feature of the program is its double-entry portfolio accounting. This capability allows you not only to record a transaction but also to specify where the funds used to buy or sell it should come from or go to. Thus, for example, a brokerage firm could use funds from a client's margin account, which gives the client a quick loan, to purchase securities. The package would then record, in the buy/sell report in the client's portfolio record, that the money for the purchase of those securities came from the margin account.

The Professional Portfolio keeps track of stock splits by putting them in separate

files. Thus, it gives you a permanent record of the split and an accurate record of the stock price and the extra shares the client gained as a result of the split.

When a bond is sold, the system automatically keeps track of the accrued interest, so that the broker will know how much interest is due to the client. It also keeps income from interest separate from capital gains for tax purposes.

Data is easily transferrable to *1-2-3* format, which is a nice plus. For transferring automatic price updates into your reports, you can use either Interactive Data Corp. (IDC) or Warner Computer Systems online databases.

QUALITY REPORTS The breadth and quality of Advent's five categories of reports are excellent. All reports can be run for an individual account or a group of accounts. You even specify the period of time that you want the reports to cover. All reports may be viewed on-screen, printed, or saved to a file.

The first two categories are management reports 1 and 2. Both are geared for use by account managers, brokers, or branch managers. You can use them as sales tools, to track account progress, or to review information.

Management reports 1 performs functions such as overview of assets, appraised value of a portfolio or group of portfolios, master stock and bond listings, cash cross reference, and short- to long-term reports.

Management reports 2 keeps track of information a broker needs in-house, for example, a listing of the clients of each broker and the amount of commissions each client has made for each broker. It will alert you to the dates that bonds mature and options expire, report on trading activity, and keep a master summary of all transactions.

Client reports, the third category are those a broker would send to clients. These will give you a portfolio summary broken down by security type, appraisal by security type or industry group, realized and unrealized gain/loss with percentage and dollar figures, a transaction summary, interest and dividend income, flow of funds, cash ledger, purchase and sale, and a bank notification letter.

The fourth category of reports is called "performance and billing." This report tracks asset performance and keeps a summary of management fees and a management fee schedule.

The final category is custom reports for creating your own reports. Many brokers will like the flexibility that this report affords. However, the predefined reports are very thorough, and most users will find them sufficient.



CIRCLE 121 ON READER SERVICE CARD

FAST AND FRIENDLY Although I did not really tax the program by entering large amounts of data, it was fairly fast and somewhat user friendly (polite error messages come up when incorrect data is entered). It tells you when it is calculating, so that you do not have to wonder if it is just thinking or working. Unfortunately, the help functions, the documentation, and the index are very vague and general. None of these tell you exactly how to use the reports or what you're supposed to use them for. There is no tutorial, but a step-by-step sample session (which could be more extensive) gives you some idea of what lies ahead. Luckily, Advent has its own technical support staff, and they are thorough and helpful.

Installation of the system is very easy. One limitation for PC users with two floppy drives is that they will be able to run only the demo version of the software, which does everything the full-blown version does except download prices automatically. However, users who will benefit most from this package will probably need the space and speed afforded by a hard disk system sooner or later anyway.

Other than the skimpy documentation and help, which make the program rather difficult to learn, the only drawback to the package is that you need to learn an excessive number of abbreviations in order to enter data. For example, you need to learn nine codes to specify types of transactions plus 14 abbreviations for different types of securities. A template with abbreviations and basic functions would help greatly.

Overall, *The Professional Portfolio* is very good, although the reports are the highlight of the package. Though it carries the curse of tedious initial data entry that every portfolio management package carries, *The Professional Portfolio* could do a lot for large-volume brokers.

—Nancy Gill

PC MAGAZINE FACT FILE



The Professional Portfolio
Advent Software Inc.
512 Second St.
San Francisco, CA
94107
(415) 543-7696
List Price: $5,200

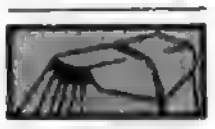
Requires: 128K RAM, one double-sided disk drive, DOS 2.0 or later, modem and hard disk recommended.

In Short: Overall the package is very good, though the reports are the highlight. However, the documentation is skimpy and data entry is tedious.

CIRCLE 602 ON READER SERVICE CARD

★ EDITOR'S CHOICE

VISIBLE ASSET



Visible Asset from Pinstripe Software Ltd. is designed for the professional broker who not only tracks his clients' investments but also prospects for new clients and keeps extensive notes on everyone. At $1,495, *Visible Asset* is an investment in itself, but one that could pay large dividends to professionals looking for a single program to solve their office information problems. Speed and ease of use are *Visible Asset*'s most prominent characteristics.

Visible Asset uses the Btrieve file-management utility: a balanced tree-indexing scheme that routes data to the screen (or the printer) almost as fast as you can type in the request.

Contributing to *Visible Asset*'s ease of use is a clear and simple menu structure that allows you to select an option either by highlighting your choice and pressing the Enter key or by typing in the number of the option. The package also offers an extensive, context-sensitive, help facility.

TUTORIAL-TYPE MANUAL The well-organized, clearly written manual includes a complete index and a 10-page quick reference guide, summarizing the use of each function key as well as all keystroke sequences. The Getting Started chapter of the manual provides clear, step-by-step installation instructions. The rest of the 208-page manual is essentially a written tutorial with examples.

Like all portfolio management software, *Visible Asset* is essentially a database application. The program holds data in four databases: client and prospect information, information about individual securities, transaction records, and calendar items, which are two-line notes that you can recall by date or subject.

When you enter a new client or prospect into the database, *Visible Asset* presents you with a screen of blank fields for recording everything from name, address, and social-security number to occupation, income, and tax bracket to eight user-definable interest codes. Later, you can recall any of this information to the screen by specifying either the client's name or account number. Once you have found him again, if you have a modem attached to your PC, *Visible Asset* will automatically dial his phone number. Then you can use *Visible Asset*'s calendar function to make notes about the conversation while keeping all of the client's portfolio information on the screen. You can enter additional calendar items for each client/prospect and use them as a call log or as a "to do" list for the future.

Visible Asset also has screening capabilities that allow you to search the client/prospect database for those who meet specified criteria. The program then generates a list of their names, addresses, account numbers, and phone numbers and sends it to your screen or printer. You can even print these names and addresses on mailing labels or send them to an ASCII file for export to a word processor.

QUICK SEARCHES And *Visible Asset*'s search facility is fast. As an example, I entered 75 client records, giving each client one or more of three interest codes. I then "bought" varying amounts of IBM and/or Apple stock for each of them. When I asked *Visible Asset* to print a contact list of just those who owned more than 100 shares of IBM and had an interest in tax shelters, the names, addresses, and phone numbers came up on my screen faster than my 180-characters-per-inch printer could print them out.

Entering information about particular securities is also simple. You classify the security as one of 15 generic types from common and preferred stocks to corporate, municipal, and government bonds to tax shelters and annuities. *Visible Asset* then calls up the appropriate fields for each type of security—coupon, yield and maturity

date for bonds, dividend rate for stocks, and so forth—for you to fill in. You must also specify whether or not you want to update price data automatically from a commercial data service. If you have a modem, you can easily download prices from *Visible Asset*'s "update prices" menu, which contains selections for Warner Communications, Dow Jones News/Retrieval, and IDC.

Like the client database, the securities database lets you enter multiple, dated calendar notes about particular securities. *Visible Asset* also has a menu for recording stock splits and dividends. In addition, the package automatically records stock splits and dividends in all applicable records. Finally, you can screen data about securities in the same way that you do with clients/prospects.

Visible Asset is so thorough that it even helps you enter transactions for your clients. For instance, if you specify the total commission, *Visible Asset* will calculate the unit commission, and vice versa.

Once you've entered all current transaction data in a client's portfolio, you can generate any of *Visible Asset*'s eight portfolio reports, which include portfolio appraisals, a realized gain/loss report, a transaction listing, a cash flow report, a projection of income (by calendar quarter), and a list of holdings that will go from a short-term to a long-term tax status within a specified date range. The reports are well organized and should be complete enough for most of a professional broker's needs. Unlike some other packages, *Visible Asset* does not allow you to custom-design report forms, but you can send the reports to an ASCII disk file for use with word processors or spreadsheets as well as to your screen or printer.

For ease of learning, ease of use, and speed of execution, *Visible Asset* gets my highest recommendation to the professional broker.—**Loren Amsden**

PC MAGAZINE FACT FILE



Visible Asset
Pinstripe Software Ltd.
8260 Greensboro Dr.,
#137
McLean, VA 22101
(800) 854-9700
(703) 790-8488
List Price: $1,495

Requires: 256K RAM, two double-sided disk drives, DOS 2.0 or later, hard disk and modem recommended.

In Short: Easy to learn and use as well as fast, this package is recommended for the professional broker.

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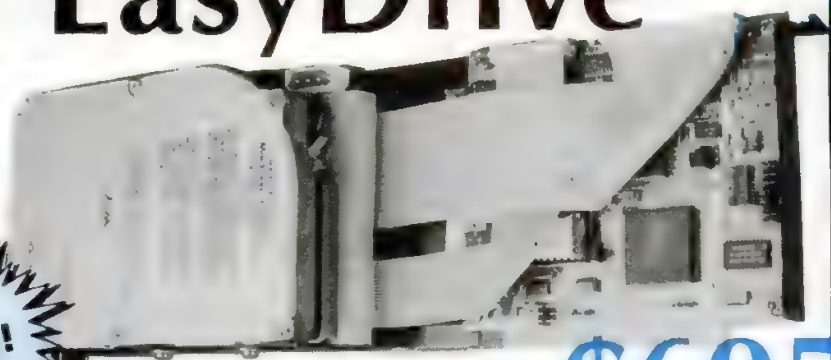
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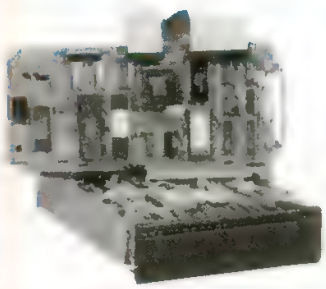
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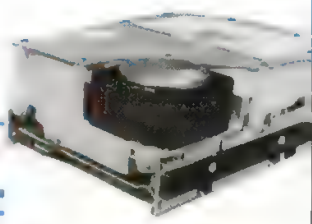
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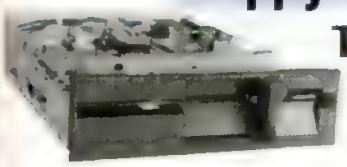
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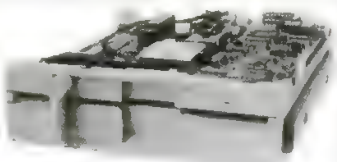
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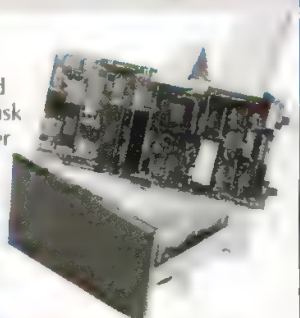
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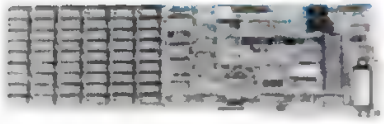
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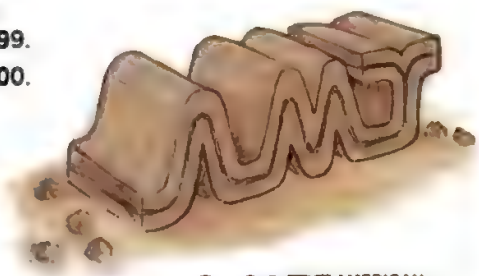
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USING SPREADSHEETS TO MONITOR YOUR PORTFOLIO

A spreadsheet template offers more flexibility at less cost than specialized portfolio management software. Here's how to construct one and how to use a spreadsheet link package to update prices from an on-line database automatically.

Although the market offers a cornucopia of specialized portfolio management packages, you may already have all the portfolio-tracking tools you need right on your software shelf.

Your spreadsheet package can serve as an alternative to specialized portfolio-tracking software. Moreover, spreadsheets offer the advantages of ready availability, relative ease of use, and flexibility to set up worksheets that meet your individual investment needs.

Unlike the typical portfolio management package that comes in a predefined and unchangeable format, a spreadsheet program allows you to construct templates that can present information in virtually any way. For example, you may have maintained worksheets of your portfolio information by hand in a certain format for many years. Since you are accustomed to making investment decisions based on these worksheets, you may wish to create identical worksheets with a spreadsheet program to improve the speed and accuracy of your calculations. Also, you can easily change your template to reflect changes in your portfolio management strategy.

Another problem with using portfolio management software is the difficulty of locating a package appropriate to your needs. Because of the specialized nature of the software, it is not normally sold in local computer stores, so these stores are not equipped to provide the information you need to make a purchasing decision. If you can't find a package that meets your needs, a spreadsheet program is a logical second choice.

A final roadblock is cost. If you have a relatively small portfolio, you may simply not want to pay the price for specialized portfolio management software, especially if you own a spreadsheet package.

On the other hand, using a spreadsheet program to monitor a portfolio is not for

everyone. To make it pay, you must not only own one, you must know how to use it well enough to construct a template.

One of the main attractions of a typical portfolio management software package is its ability to retrieve current security prices from an on-line service, such as the Dow Jones News/Retrieval, and automatically update the prices of all securities in your portfolio. A spreadsheet program alone will not enable you to do this. However, spreadsheet-link programs are available that can automatically retrieve current security prices and update your spreadsheet portfolio.

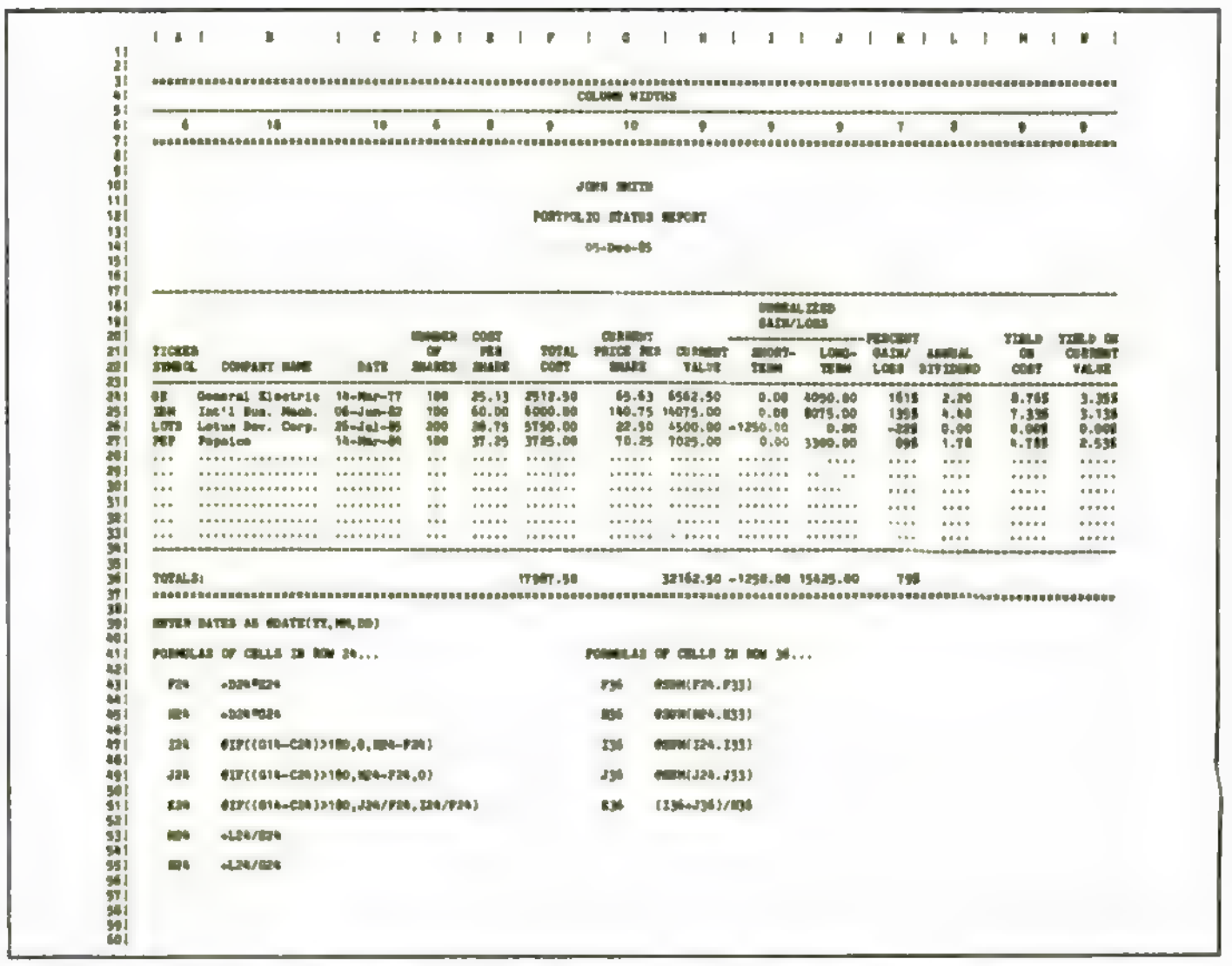
HOW TO CONSTRUCT A SPREADSHEET TEMPLATE Before constructing a spreadsheet template to monitor your portfolio, you should identify the types of investment information you want to include in the template. Do you want only stocks, or do you need other types of investments, such as bonds, options, mutual funds, and commodities? What about cash and real estate?

Next, define the data items you want to include for each type of investment and, more importantly, the measures of performance. Figure 1 shows a *1-2-3* template that has been constructed to monitor a portfolio of stocks. To construct a similar template, you can use the formulas and column widths noted on the figure.

To use the template, you start by entering the ticker symbol, company name, date of purchase, number of shares purchased, cost per share, current price per share, and annual dividend for each stock.

The template is set up to automatically calculate the total cost and current value of the portfolio. In addition, it computes four measures of the portfolio's performance, namely, the unrealized short- or long-term gain or loss, percent gain or loss, yield on cost, and yield on current value.

Any stock owned over 180 days is considered to have been held long-term for income tax purposes and normally receives a more-favorable tax treatment than stocks held short term or less than 180 days. To calculate the unrealized short- or long-term gain or loss on a stock, this template first determines the number of days the stock has been held and then classifies the difference between the current value and total cost as either short- or long-term.



COLUMN WIDTHS

6 10 10 6 8 9 10 9 9 9 7 8 9 9

JOHN SMITH

PORTFOLIO STATUS REPORT

05-Dec-85

TICKER SYMBOL	COMPANY NAME	DATE	NUMBER OF SHARES	COST PER SHARE	TOTAL COST	CURRENT PRICE PER SHARE	CURRENT VALUE	UNREALIZED GAIN/LOSS SHORT-TERM	UNREALIZED GAIN/LOSS LONG-TERM	PERCENT GAIN/ LOSS	ANNUAL DIVIDEND	YIELD ON COST	YIELD ON CURRENT VALUE
GE	General Electric	10-Mar-77	100	25.13	2512.50	65.63	6562.50	0.00	4050.00	161%	2.20	8.76%	3.35%
IBM	Int'l Bus. Mach.	06-Jun-82	100	60.00	6000.00	140.75	14075.00	0.00	8075.00	135%	4.40	7.33%	3.13%
LOTS	Lotus Dev. Corp.	25-Jul-85	200	30.75	5750.00	22.50	4500.00	-1250.00	0.00	-22%	0.00	0.00%	0.00%
PEP	Pepsico	10-Mar-80	100	37.25	3725.00	70.25	7025.00	0.00	3300.00	89%	1.76	4.73%	2.51%
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TOTALS:					17987.50		32162.50	-1250.00	15425.00	79%			

ENTER DATES AS @DATE(YY,MM,DD)

FORMULAS OF CELLS IN ROW 24...

F24	+D24*E24
H24	+D24*G24
I24	@IF((@TODAY-C24)>180,0,H24-F24)
J24	@IF((@TODAY-C24)>180,H24-F24,0)
K24	@IF((@TODAY-C24)>180,J24/F24,I24/F24)
M24	+L24/E24
N24	+L24/E24

FORMULAS OF CELLS IN ROW 36...

F36	@SUM(F24..F33)
H36	@SUM(H24..H33)
I36	@SUM(I24..I33)
J36	@SUM(J24..J33)
K36	(I36+J36)/H36

Figure 1: *To manage your portfolio using Lotus's* 1-2-3, *you can construct a template similar to the one shown above by using the formulas and column widths noted here.*

After you enter the initial data, you can update your portfolio at any frequency you wish, say, daily, weekly, or monthly. You simply enter the current price per share for each stock and change the annual dividend, if required, for any of the stocks. Assuming you have a portfolio of 10 to 15 stocks, an update takes only a few minutes. To keep permanent records, I have set the sample template's column widths to print the template in a compressed mode on standard 8½ by 11 paper.

SPREADSHEET LINK PACKAGES To speed the process of updating the information in your portfolio and reduce the chance of typographical errors from manual data entry, you may want to consider a spreadsheet-link package. These link programs transfer data, such as current price quotes, from an on-line database to your spreadsheet template.

When you use a spreadsheet link program, you will incur charges for the actual time you are connected to an on-line database. These charges will vary depending upon the on-line database that you access and what time of day it is.

Let's take a closer look at two spreadsheet link programs, namely *Dow Jones Spreadsheet Link* and Smith Micro Software Inc.'s *Market Link*.

DOW JONES SPREADSHEET LINK The *Dow Jones Spreadsheet Link* transfers financial information to your spreadsheet template from several of the Dow Jones News/Retrieval databases, including Current Quotes, Historical Quotes, Media

PC MAGAZINE FACT FILE



Dow Jones Spreadsheet Link
Dow Jones Software
P.O. Box 300
Princeton, NJ 08540
(800) 257-5114
(609) 452-1511 (in N.J.)
List Price: $249

Requires: 128K RAM, two double-sided drives, modem.

In Short: If you want to use Dow Jones News Retrieval data, this package is a straightforward and easy-to-use package.

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General Financial Services, Disclosure II, and Corporate Earnings Estimator. Also, the *Dow Jones Spreadsheet Link* has a terminal program to access all Dow Jones News/Retrieval databases and a program that uses data files from the *Dow Jones Market Manager*.

To use the *Dow Jones Spreadsheet Link*, you must construct your templates in a specific format to enable Dow Jones News/Retrieval to retrieve the data you require. In the first column of each template, you enter the ticker symbols of your securities. In addition, you must precede each ticker symbol with the letter V and a hyphen (V-). For example, to retrieve information on IBM, you would enter V-IBM.

Across the top row of the template, you also enter V- codes to identify the type of data you want to download for each security. For example, in the template shown in Figure 1, you would enter V-LAST at the top row of Column G to retrieve the current price per share and V-DIVIDEND at the top row of Column L to retrieve the annual dividend per share. The manual includes a complete list of these V- codes.

You construct the rest of the template in the normal fashion and include other rows and columns and perform calculations throughout. Once you've designed the template, you can save it as you normally would, with no special filename.

Next, you exit the spreadsheet program and load the *Dow Jones Spreadsheet Link*. At the main menu, you choose to retrieve information for the spreadsheet. At the prompt, you enter the filename of the template you want to use. At this point, *Dow Jones Spreadsheet Link* enters an editing routine. During this edit, the program examines the construction of your template for flaws that would cause errors during an on-line session with the Dow Jones News/Retrieval. After completing the edit, the *Dow Jones Spreadsheet Link* automatically logs onto Dow Jones News/Retrieval, retrieves and stores the requested information, and logs off.

The *Dow Jones Spreadsheet Link* does not automatically store the information retrieved in the spreadsheet template, however. Rather, the program stores it in a file called DJ. To load the data into your template, you must reload the spreadsheet program, load the template you are using, and then load the data retrieved over it.

Overall, the *Dow Jones Spreadsheet Link* is straightforward and easy to use. The user's manual is excellent, with detailed instructions, illustrations, and sample templates throughout.

The value of the *Dow Jones Spreadsheet Link* depends on the amount and type of information you require and how often you need the data. However, if you find portfolio management software package report formats too rigid but don't want to give up automatic retrieval of data from an on-line service, the *Dow Jones Spreadsheet Link* may be your solution.

■ Market Link includes a terminal mode to access the Dow Jones News/ Retrieval and The Source.

MARKET LINK At $85, *Market Link* from Smith Micro Software is a low-cost alternative to the *Dow Jones Spreadsheet Link* for investors who want to retrieve only current price quotes.

Market Link is, in essence, a communications program. It accesses Dow Jones News/Retrieval and The Source to obtain current price quotes for up to 120 securities, including stocks, bonds, options, mutual funds, and treasury bills.

The package automatically retrieves the open, high, low, last price, and volume for each security and stores them on a disk in ASCII format. Spreadsheet users can then convert the data to a file for use in a spreadsheet template. With *1-2-3*, for example, you would use the /File Import command.

The program is straightforward and easy to use, requiring only one keystroke for virtually every function. The main menu contains six choices: System Parameters, Update Symbol List, Set/Recall Auto Fetch, Link to Dow Jones, Link to The Source, and Terminate Run.

You select System Parameters the first time you use *Market Link* to specify the type of equipment you are using as well as telephone numbers and passwords used to access either Dow Jones News/Retrieval or The Source. The main menu's Update Symbol List choice lets you enter up to 120 security symbols that the system uses for automatic retrieval of quotes.

When you select the Set/Recall Auto Fetch choice, you can set up *Market Link* to immediately retrieve quotes for the securities included in your symbol list or to retrieve quotes at any of up to eight predefined times during the day or night. This feature enables you to analyze price and volume activity throughout the trading day. For example, to monitor security prices on an hourly basis, you can instruct the program to retrieve quotes at 10 a.m., 11 a.m., 12 p.m., 1 p.m., 2 p.m., 3 p.m., and when the market closes at 4 p.m.

Market Link also includes a terminal mode that enables you to access all of the services available on Dow Jones News/ Retrieval and The Source. You use the package's built-in link to Dow Jones and to The Source for this purpose.

Although this package limits the type of information you can retrieve and transfer to a spreadsheet to current quotes, if that is all you require, *Market Link* performs the function without any difficulty.

CONCLUSION Spreadsheet programs offer investors a great deal of flexibility in constructing the reports necessary to monitor their portfolios. Add to that the data retrieval capability of the spreadsheet link programs and many investors will find them an attractive alternative to portfolio management software packages.

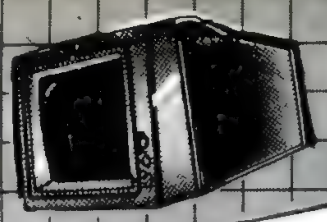
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Software Inc.
P.O. Box 7137
Huntington Beach,
CA 92615
(714) 964-0412

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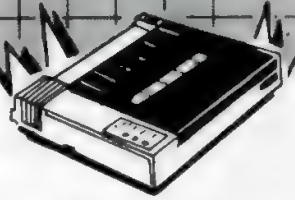
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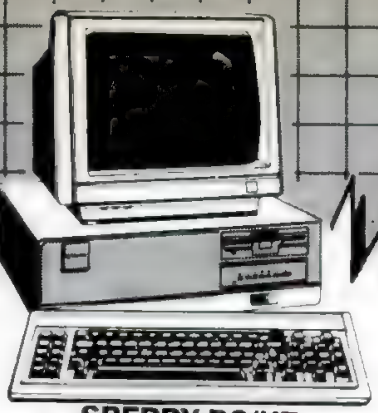
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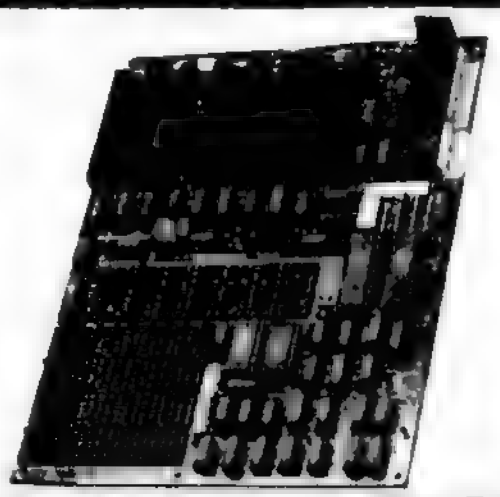
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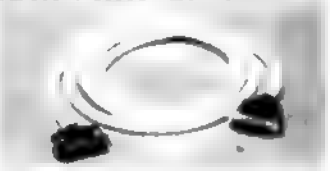
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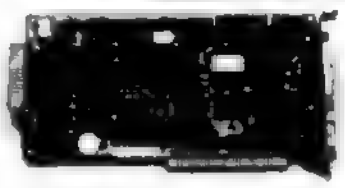
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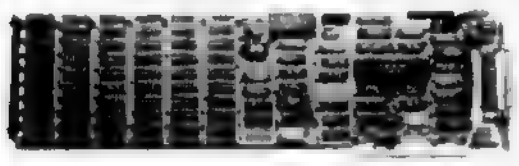
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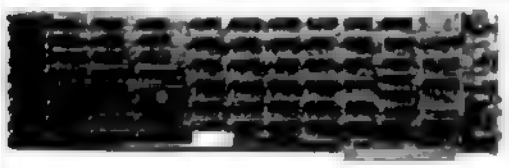


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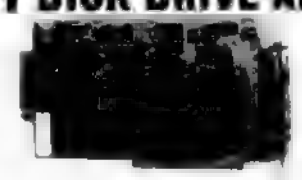
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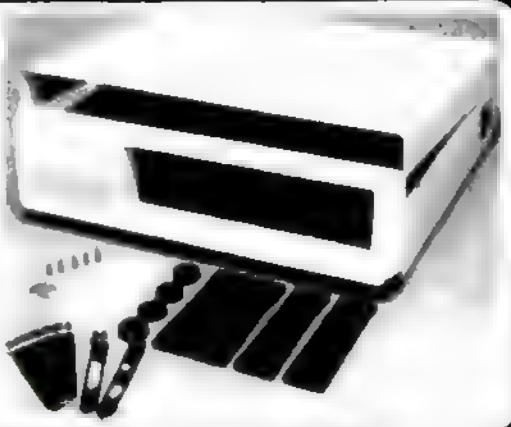
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SOFTWARE FOR FINANCIAL SECURITY

Assessing bonds and other fixed-income securities poses a complex investment challenge. Here are some programs that help minimize the guesswork.

Bonds and other fixed-income or debt securities pose some difficult challenges to the investor. To determine whether they are right for you, you need access to a complex mix of fundamental company analyses, yield computations, and quality assessments. Careful tax planning must supplement that effort. But now there's help, since the attempt to take much of the guesswork out of investing with the help of the PC has not ignored bonds and other fixed-income securities. Many software programs for the PC are now available to help both amateur and professional portfolio managers analyze these types of securities.

The three software programs described here are designed to assume part of the burden that falls on the fixed-income securities analyst. These programs—*Fixed Income Securities Trading System* from Bond-Tech Inc.; *PBMS Bond-Aid*, a professional bond management system from Distributed Micro Systems; and *CV Evaluator* from Beta Systems—range in price from $295 to $1,250 and are representative of what all the other programs on the market offer the fixed-income security analyst. All relatively easy to use, they give you roughly the same functions of yield and capital gain calculations for different types of fixed-income securities, bond swap and convertibility analysis, and portfolio management.

To make the comparison clearer, we examine the outputs of these three programs in the context of what bonds and other fixed-income or debt securities are all about. Each program is used to illustrate a different aspect of fixed-income securities analysis—like determining yield or benefiting from bond swapping—or a different part of the fixed-income securities market such as municipal bonds, mortgage-backed securities, and convertibles. This background information will be especially useful for those of you who are new to the fixed-income securities market.

THE VOLATILE MARKET Traditionally, bonds and other fixed-income or debt securities have been key ingredients of a balanced portfolio. In fact, bonds are often considered to complement stocks in investment portfolios. But these types of securities differ from stocks significantly. Unlike stocks, which are dividend-yielding shares in a company, bonds and other fixed-income or debt securities are interest-bearing IOUs. Examples of these types of investments are corporate bonds, tax-free municipal bonds, Treasury issues, certificates of deposit and commercial paper, and mortgage-backed securities.

The fixed-income and debt securities market has become extremely volatile. Some investment strategies call for moving into stocks when the stock market is at a low and into bonds when the stock market is high. But fluctuations in the value of stocks and bonds do not always cooperate with this scheme. You can't always count on them to follow the same neat, predictable patterns. The programs described here can be particularly helpful when faced with volatile market conditions—for example, when yield determination requires you to do complex calculations and when you must factor in tax impact and convertibility benefits.

BOND CHARACTERISTICS The three most important elements of bonds are yield (the percentage of its cost that it gives the bond owner in income), quality (the credit rating of the bond issuer), and maturity (the length of time you have to hold a bond before its issuer will pay back the bond owner's money). These three characteristics vary from bond issue to bond issue, and issuers can create a vast variety of bonds, all with different characteristics.

Yield is one of the most important characteristics of a bond that you will want to calculate before investing in it. Bond prices are generally quoted in terms of a certain percentage of maturity value (98½, 103, and so forth) or in terms of yield to maturity. Yield to maturity is the sum of the bond's interest payments over its lifetime and the price difference between its discounted price and par, or amount due at maturity. The changes in prices due to changes in competing interest rates always reflect a bond's yield to maturity.

```
                    Fixed Income Security Trading                    MODE=CALC

Security Number:                    Issue Date:                  | Data File Parameters
Security Code:                      1st Coupon:                  |  Default Overrides:
Settlement Date: 11-15-85           Call Date:                   |    Coupons/Year:
Security Type:   1                  Call Price:                  |    Yield Method:
Coupon (%):      10                 Tax (%)-Cpn: 20              |    Range Tick Val:
Maturity Date:   11-15-15                     -Gain: 50          |
Trade Basis:     11.5.....                                       |    Trading Risk
Concession:                                                      |    Beta:
                                                                 |    Net Position:
Dollar Price =  87.412108     (13.19 32NDS)                      |
Yield to Mat = 11.500%     Val 1/32= 0.0042 %                    |   Report Settings:
$Val of 1 BP = $ 739.78                                          |    Quote Sheet:
Bkevn O/N Fin= 11.377%                                           |    Yield Curve:
Duration= 8.985  Mod Dur.= 8.496  Adj Mod.= 8.496                |    Range Table:
True Aftx Yld=  9.200%  Taxable Cpn Eq=10.938                    |    Arb Matrix I:
                                                                 |    Arb Matrix II:
                                                                 |    Futures DBase:
                                                                 |
                                                                 |     User Field:
                                                                 |    Field 1:
                                                                 Data File =c:FIST1.dat
=================================================================Active Records= 13
```

Figure 1: FISTS *computes yields on a taxable 30-year corporate bond.*

```
                    Fixed Income Security Trading                    MODE=CALC

Security Number: 11                 Issue Date:     -  -         | Data File Parameters
Security Code:   26                 1st Coupon:     -  -         |  Default Overrides:
Settlement Date: 11-19-85           Call Date:   11-15-06        |    Coupons/Year:
Security Type:   1                  Call Price:  100.0000        |    Yield Method:
Coupon (%):      14                 Tax (%)-Cpn:                 |    Range Tick Val:
Maturity Date:   11-15-11                     -Gain:             |
Trade Basis:     127.04/                                         |    Trading Risk
Concession:                                                      |    Beta:
                                                                 |    Net Position:
Dollar Price = 127.125000     ( 4.00 32NDS)                      |
Yield to Call= 10.725%     Val 1/32= 0.0031 %                    |   Report Settings:
Yield to Mat = 10.854%                                           |    Quote Sheet:
$Val of 1 BP = $ 1010.11                                         |    Yield Curve:
Bkevn O/N Fin= 10.939%                                           |    Range Table:
Duration= 8.389  Mod Dur.= 7.962  Adj Mod.= 7.972                |    Arb Matrix I:
                                                                 |    Arb Matrix II:
                                    ----------                   |    Futures DBase: 1
PAR (000'S) !Principal-$      12,712.50                          |
10          !Interest -$          15.47                          |     User Field:
            !TOTAL    -$      12,727.97                          |    Field 1:
            !                                                    Data File =c:FIST1.dat
=================================================================Active Records= 13
```

Figure 2: FISTS *computes and compares the yield-to-call to the yield-to-maturity on a U.S. Treasury bond.*

Besides calculating the yield to maturity, you also need to calculate the after-tax impact of investing in a bond. The bond's appreciation is taxed as a long-term capital gain, and the interest is taxed as ordinary income.

These calculations are complex, and until recently investors have found performing them difficult. But now the PC can help you through these computations in several ways. Your PC and a software program designed for fixed-income securities analysis can give you additional information to use when comparing several potential investments, computing yields on trades before maturity, calculating various coupon reinvestment rates, determining a bond's duration, and projecting future prices using your expectations about future interest-rate levels. Figure 1 shows how one such program, *Fixed Income Securities Trading System* from Bond-Tech Inc., computes yields on a taxable corporate bond.

FIXED INCOME SECURITIES TRADING SYSTEM *Fixed Income Securities Trading System (FISTS),* analytical software designed for the fixed-income securities market, gives you an extensive analysis tool in one package. It can help you deal with bonds (as shown in Figure 1), notes, money markets, mortgage-backed securities, nondollar-denominated securities, and financial futures.

FISTS integrates all its analytical capabilities with a large database of fixed-income securities. So it can help you not

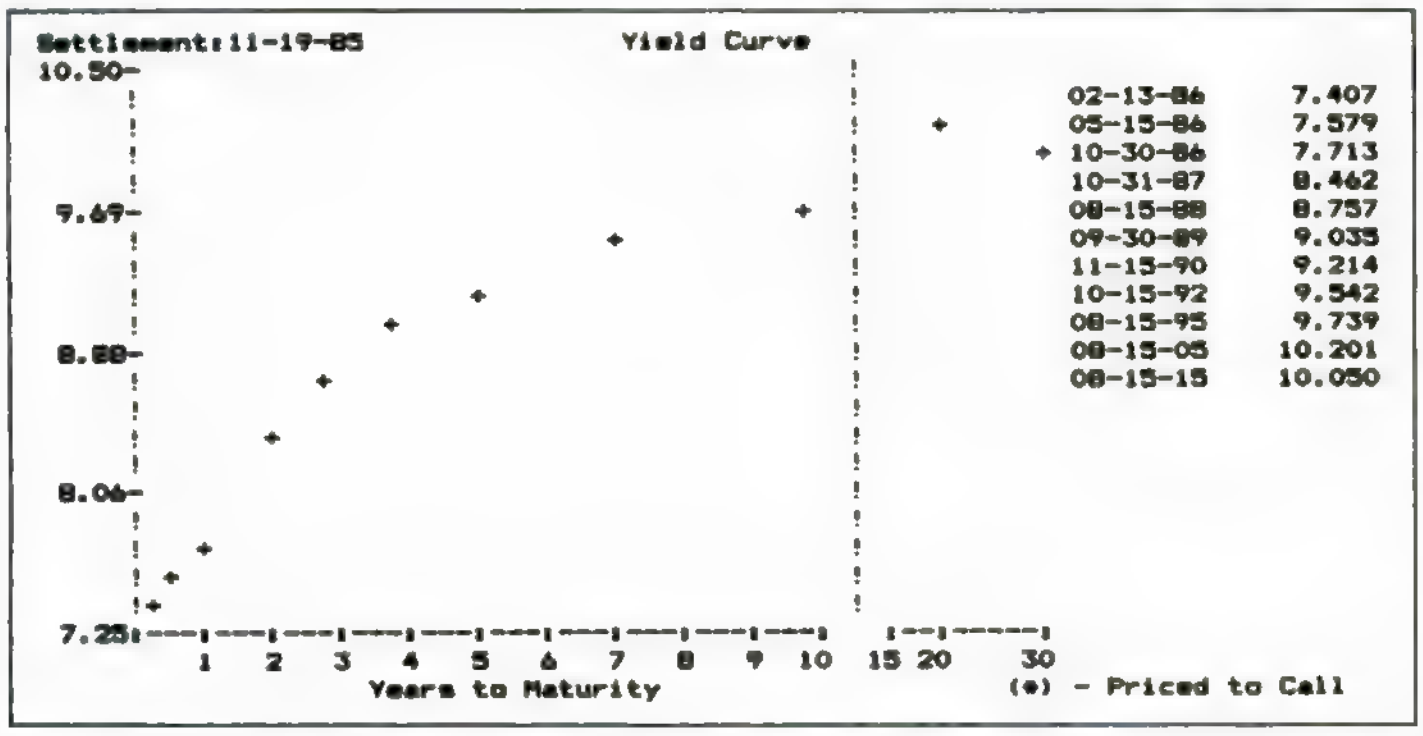


Figure 3: FISTS *draws a yield curve for a 20-year bond: The curve's shape reflects a higher future interest rate. Usually, the higher the quality of the bond, the lower its yield, and vice versa.*

```
                    Fixed Income Security Trading                MODE=CALC

Security Number:                  Issue Date:                  ----------------------
Security Code:                    1st Coupon:                  | Data File Parameters
Settlement Date: 06-01-82         Call Date:                   |  Default Overrides:
Security Type:   5                Call Price:                  |    Coupons/Year:
Coupon (%):      12.35            Tax (%)-Cpn: 0               |    Yield Method:
Maturity Date:   01-01-85                 -Gain: 20           |    Range Tick Val:
Trade Basis:     85.065....                                    |
Concession:                                                   |    Trading Risk
                                                              |    Beta:
Dollar Price =  85.065                                        |    Net Position:
Yield to Mat = 20.011%     Val 1/4=  0.1425 %                 |
$Val of 1 BP = $ 174.99                                       |   Report Settings:
Bkevn O/N Fin= 13.690%                                        |    Quote Sheet:
Duration= 2.135  Mod Dur.= 1.941  Adj Mod.= 2.059             |    Yield Curve:
True Aftx Yld= 18.958%                                        |    Range Table:
                                                              |    Arb Matrix I:
                                                              |    Arb Matrix II:
                                                              |    Futures DBase:
                                                              |
                                                              |     User Field:
                                                              |    Field 1:
                                                              Data File =c:FIST1.dat
================================================================Active Records= 13
```

Figure 4: FISTS *computes the true after-tax yield on a municipal bond, a prime consideration when surveying potential purchases.*

```
Pool Number:     4224       Coupon Rate %:  8.5000   Wtd Ave Mat: 04-07
Service Fee:     .545..     Issue Date:     12-83    Orig Face:     1,275,529.81
Days-1st Pay:    55         Matur Date:     08-01-09 State:         NJ

Factor                      Paydown  Cumulative Speed  !Settlement Date:  07-22-85
 Date      Factor           /$MM/Mo    FHA%     CPR%   !Month Prepaid:
07/84   0.93303557                     162.4    10.048 !Maturity in Mos:
08/84   0.91064413          22391      195.1    11.964 !Trade Basis:       86.21/
09/84   0.89820269          12441      198.9    12.200 !FHA Speed (%):
10/84   0.88545301          12750      202.9    12.444 !CPR Prepay %:      10
11/84   0.88428876           1164      184.6    11.397 !Orig. Par (000):    1,275,529.81
12/84   0.88313074           1158      169.3    10.513 !
01/85   0.88188466           1246      156.6     9.766 !Dlr Price= 86.656250 (21.0 32nds)
02/85   0.86901575          12869      162.9    10.149 !Mort. Yield = 11.648%
03/85   0.86775040           1265      152.3     9.525 !Semi-Ann Eq = 11.934% MAT/WAM=261
04/85   0.85224901          15501      162.0    10.099 !Brkeven Fin = 9.753%  WAL = 6.94
05/85   0.85099185           1257      152.5     9.552 !Duration= 4.135  Mod= 4.095
06/85   0.84015694          10835      155.6     9.747 !      Dollar Extensions:
07/85   0.82754625          12611      160.5    10.051 !Remain Par:          1,055,559.91
                                       Interim Speed   !Principal:            914,708.64
                            1 Mo.      247.7    15.361 !Interest:               5,233.82
    Ave Paydown/$MM         3 Mos.     153.1     9.794 !Total:                919,942.46
          9077              6 Mos.     172.1    10.667     File=c:MBS1  Record #= 52
                           12 Mos.     160.9    10.053     Active= 8    Maximum= 100
```

Figure 5: *A pool of mortgage-backed securities as analyzed by* FISTS. *The "Total" figure is the sum of principal and accrued interest.*

only analyze portfolio holdings but also monitor market movements, determine hedging opportunities and their costs, and verify trade confirmations.

Other program outputs appear in Figures 2, 3, and 4. For example, Figure 2 shows how *FISTS* computes and compares yield-to-call to yield-to-maturity.

One feature to consider in this analysis is a "call" provision. Bonds are called when prices rise and the rates fall, thus allowing the issuer to retire its higher-cost debt cheaply. Redemption is usually at "call price" of par plus a premium equal to one year's coupon. Calls are undesirable because you can lose yield. The yield you thought you were getting just isn't there, as the yield-to-maturity calculations can be negated if the bond is called. You should consider the possibility of a call as you work through your bond analysis, particularly if there's no redemption protection.

Another program output is shown in Figure 3, which is how *FISTS* draws a yield curve for a bond. A yield curve is a tool for predicting interest rate trends and deciding what maturity offers the highest yield with the least risk. It's basically a chart of the interest rates currently available on a group of fixed-income maturities of similar quality, but with maturities ranging from a few months to 20 to 30 years. A commonly used yield curve is like the one used for U.S. Treasury securities.

The normal shape of a yield curve is a gradual upward slope reflecting a steady increase in yields as maturities lengthen. This shape is determined by the fact that

PC MAGAZINE FACT FILE



Fixed Income Securities Trading System
Bond-Tech Inc.
P.O. Box 192
Englewood, OH 45322
(513) 836-3991
List Price: $1,250
Requires: 196K RAM, one disk drive, DOS 2.0 or later.
In Short: A comprehensive set of programs for knowledgeable individual investors and professionals; analyzes different types of fixed-income securities.
CIRCLE 660 ON READER SERVICE CARD

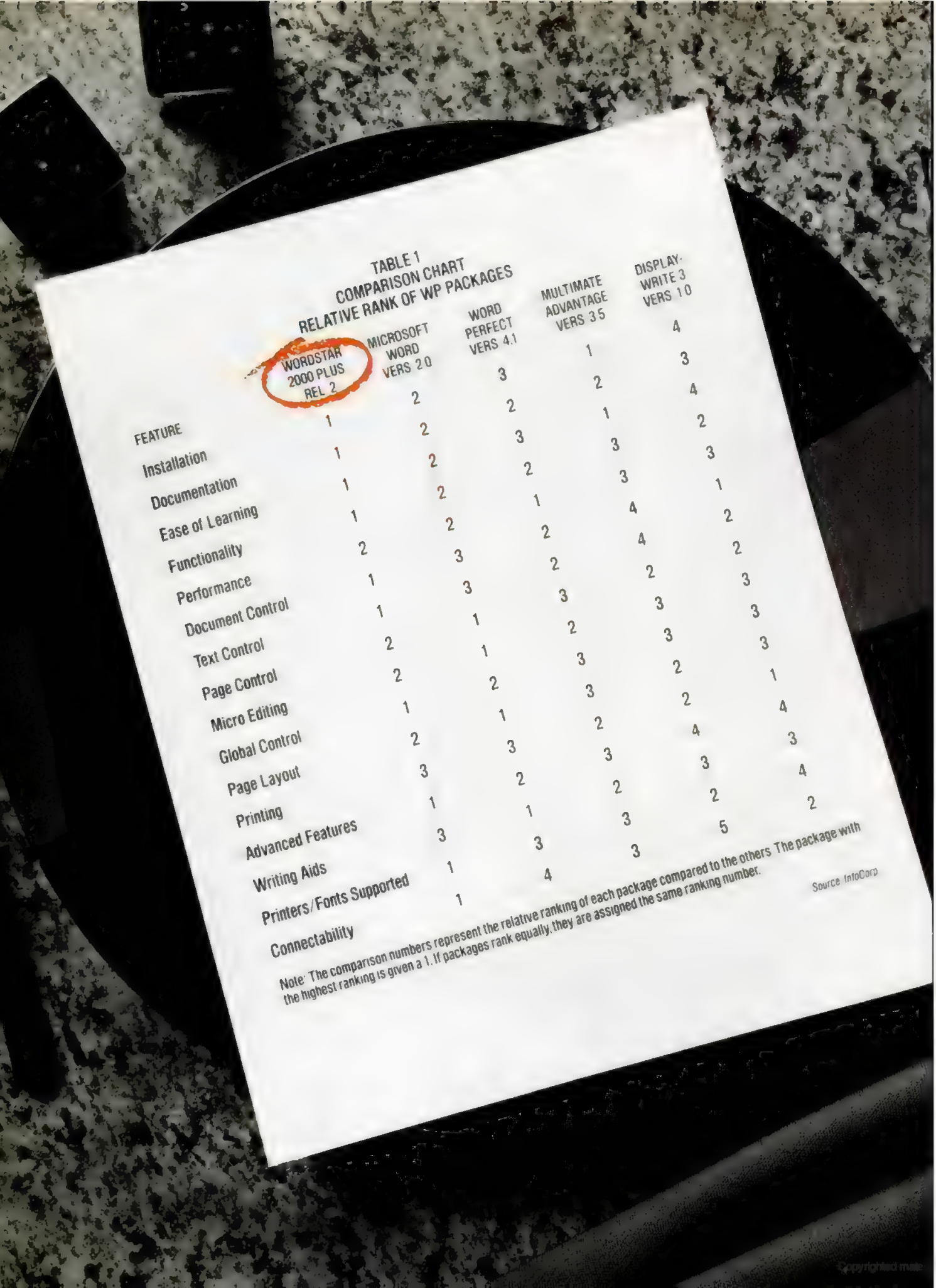


TABLE 1
COMPARISON CHART
RELATIVE RANK OF WP PACKAGES

FEATURE	WORDSTAR 2000 PLUS REL 2	MICROSOFT WORD VERS 2.0	WORD PERFECT VERS 4.1	MULTIMATE ADVANTAGE VERS 3.5	DISPLAY-WRITE 3 VERS 1.0
Installation	1	2	3	1	4
Documentation	1	2	2	2	3
Ease of Learning	1	2	3	1	4
Functionality	1	2	2	3	2
Performance	2	3	1	3	3
Document Control	1	3	2	4	1
Text Control	1	1	3	4	2
Page Control	2	1	2	2	2
Micro Editing	2	2	3	3	3
Global Control	1	1	3	2	3
Page Layout	2	3	2	3	3
Printing	3	2	3	2	1
Advanced Features	1	1	2	2	4
Writing Aids	3	3	3	4	3
Printers/Fonts Supported	1	4	3	3	4
Connectability	1	1	3	5	2

Note: The comparison numbers represent the relative ranking of each package compared to the others. The package with the highest ranking is given a 1. If packages rank equally, they are assigned the same ranking number.

Source: InfoCorp

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CIRCLE 232 ON READER SERVICE CARD

time creates additional risk, including the possibility of higher interest rates and inflation on, say, a 20-year bond as compared to a 1-year Treasury bill.

Bonds are rated for quality according to the credit standing of the bond issuer. So bonds issued by companies or municipalities that have a low credit standing will be rated lower in quality. Usually, the higher the quality of the bond, the lower its yield. Conversely, the lower the bond rating, the higher the interest rate offered. Quality of the bond may also influence the volatility of a bond's market price and therefore its market risk.

Figure 4 shows how *FISTS* computes the true after-tax yield on a municipal bond. Municipal bonds come in a wide variety of kinds and maturities. Four types of municipal bonds are general obligation, revenue, special tax, and housing municipal bonds. Investing in municipal bonds can be quite advantageous to many taxpayers, since interest on them is exempt from federal and usually state taxes.

■ FISTS fits the strategies of many fixed-income securities investors; its price fits their generally large pocketbooks.

When you consider buying a municipal bond, the object is to locate a high-quality issue, determine its yield, and compare it to a taxable corporate bond. Your comparison must take into account your marginal tax rate. Municipal bond brokers often have tables comparing municipals' interest against that of corporate bonds for several taxable income ranges. These charts are adequate when judging the possible tax benefits of municipal bonds over corporate bonds, but you need to look at your actual marginal tax rate, as the output of *FISTS* shows in Figure 4, to determine if municipals are better for you than corporates.

Figure 5 shows how *FISTS* analyzes a pool of mortgage-backed securities. Mort-

```
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PBMS - BOND SWAP SUMMARY FOR: JULIA TYLER                          Page  1
       ACCOUNT NUMBER: 41739
       ACCT:

       PHONE: (415) 692-5855
       Prepared on: 11-29-1985

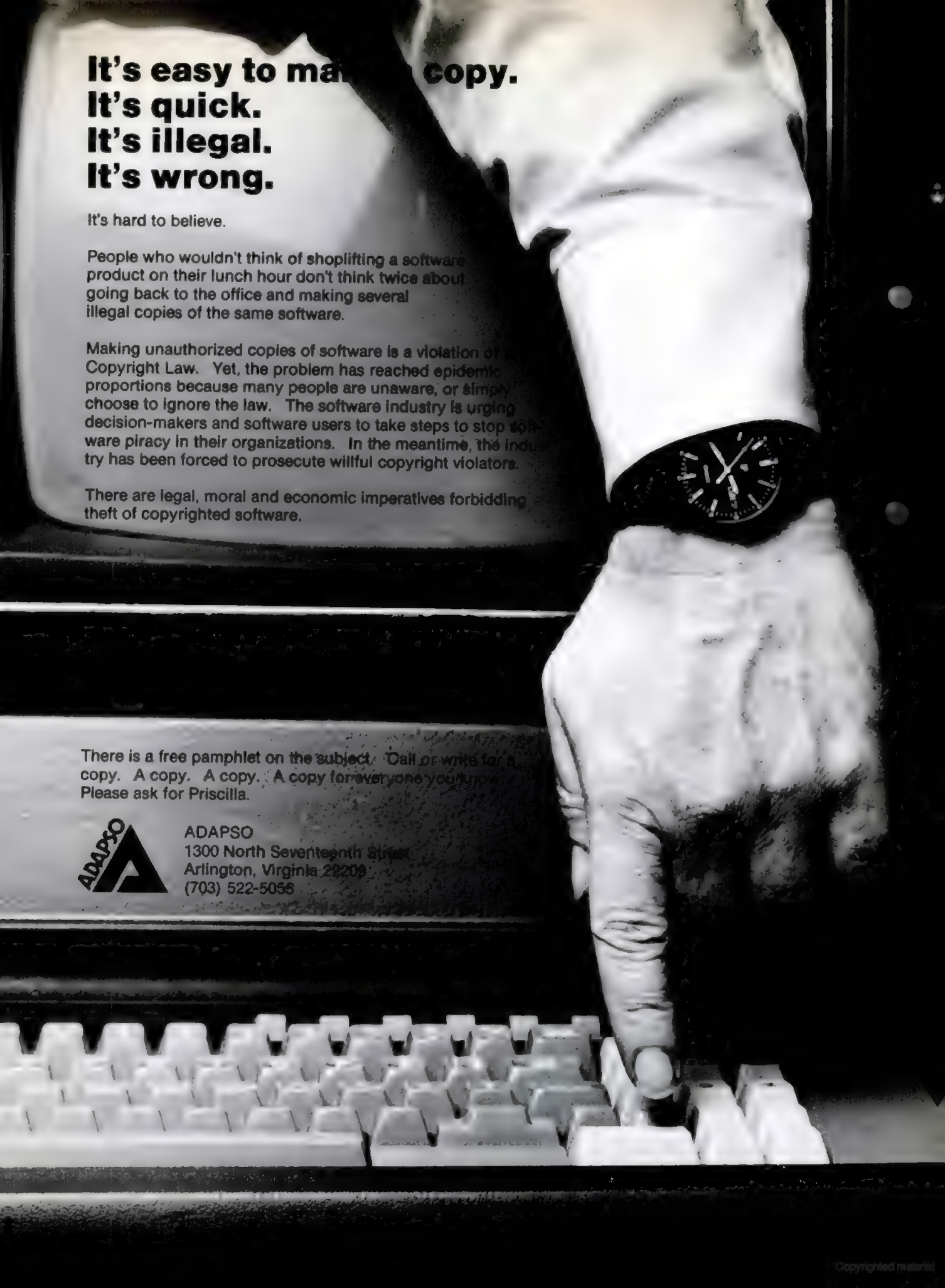
                      CALCULATED BOND SWAP AVERAGES
=============================================================================
|   CLASS            PORTFOLIO          INVENTORY          RESULTS          |
|   -------          ----------         ----------         ---------        |
|  Par Value:            300                300          Up 0              |
|  Income:           $30,000.00         $44,500.00       Up   $14,500.00     |
|  Average Coupon:     10.000%            14.830%        Up  4.830%         |
|  Average Maturity:    6.99 yrs          26.90 yrs        Up 19.91 yrs      |
|  Average Yield:      10.103%            15.303%        Up  5.200%         |
|  Average Rating:       N/R                N/R          Up 0.00 pts        |
=============================================================================

=============================================================================
|                          PORTFOLIO SALES DATA                             |
|                          --------------------                             |
|                                                                           |
|  Original Cost:   $305,000.00  Proceeds:   $301,500.00   Loss:    $3,500.00 |
|  Short Term:            $0.00  Long Term:   -$3,500.00   Accrued: $10,272.22 |
=============================================================================

=============================================================================
|                        INVENTORY PURCHASE DATA                            |
|                        -----------------------                            |
|                                                                           |
|  Purchase Cost:   $291,639.50                            Accrued:  $8,252.78 |
=============================================================================

=============================================================================
|                          SWAP CASH SUMMARY                                |
|                          -----------------                                |
|                                                                           |
|          Total Cash (Portfolio - Inventory):   $9,860.50                  |
|                    Total Accrued Interest:     $2,019.44                  |
|                                                ---------                  |
|                  Total Cash Returned for Swap: $11,879.94                 |
=============================================================================
```

Figure 6: PBMS Bond-Aid *summary of a proposed swap between an investor's bond portfolio and a broker's inventory. Bond swaps are usually done in conjunction with a tax reduction strategy.*



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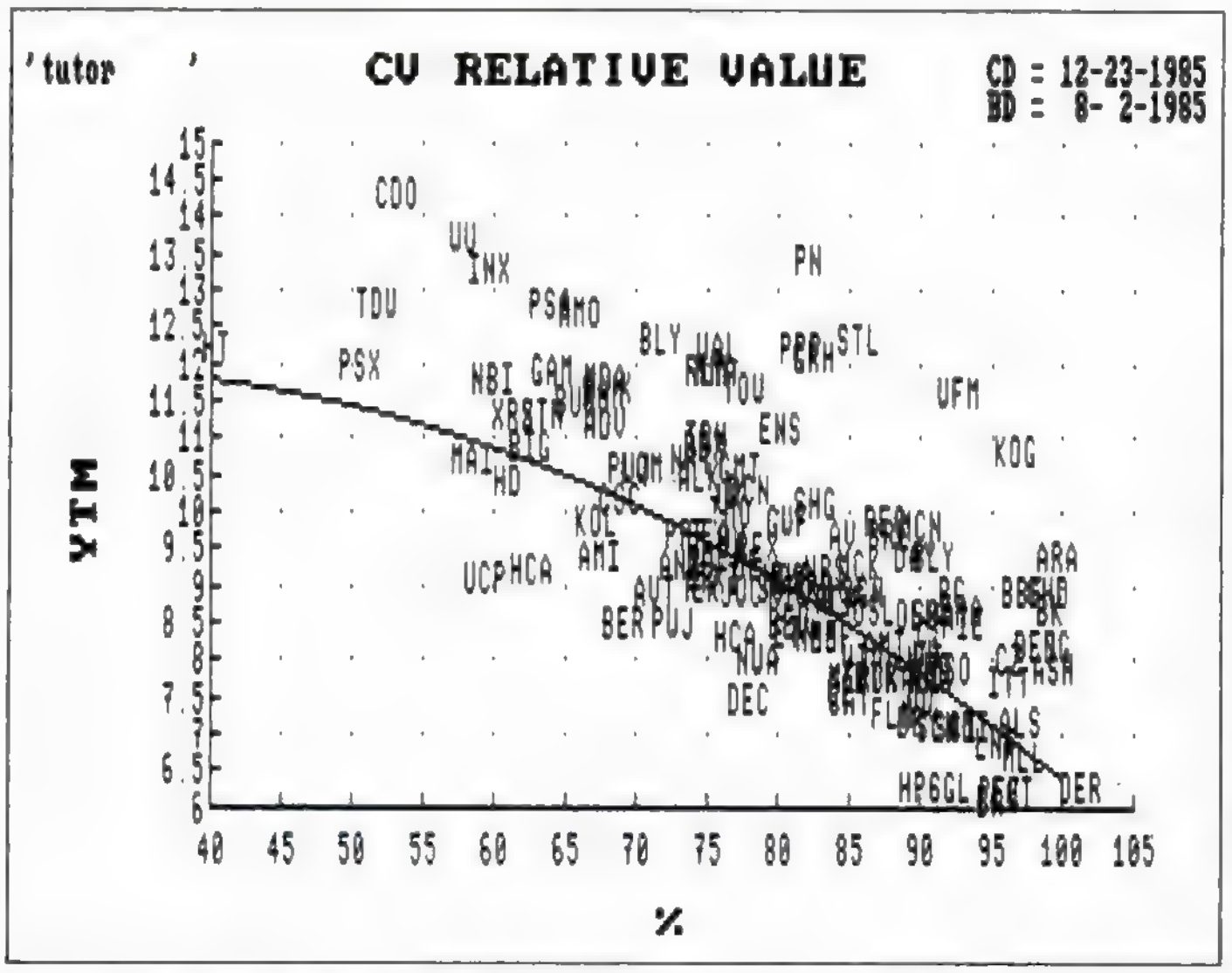


Figure 7: *This scatter diagram of a file of convertible bonds in* CV Evaluator *shows the change in yield to maturity caused by increasing the percentage, which is the inverse of a premium value.*

gages are similar to bonds and are suited for persons who want a minimum fixed monthly income. However, the steady yield of mortgage-backed securities assumes that there will be no prepayment of principal, which may have a significant effect on yield. Investment return on mortgages is reflected in interest rates, which in turn reflect the degree of risk in this type of investing. Good-quality mortgages may offer comparable or better returns than bonds and usually entail less risk.

Mortgages are not as liquid, however, as other forms of investment. They usually entail having your money tied up for a long time. To provide more liquidity, the government developed a secondary market in mortgages, and consequently several federal agencies participate in the mortgage market. These agencies purchase mortgages from the originating group, financing them by selling debentures. They may also finance mortgage purchases by selling participation certificates, or "pass-through" securities. These pools of mortgages, financed by the VA, FHA, FHLMC, GNMA, and FNMA, are sold in rather large denominations ($25,000 or more), with the owner receiving interest or principal on a monthly basis. All payments on these mortgages pass through the pool without being taxed until they reach the individual certificate owners.

FISTS's design fits the strategies of many fixed-income securities investors, and its $1,250 price tag fits their generally large pocketbooks. Since the overall market for this kind of software is smaller than that for equity analysis programs, *FISTS* and others like it are bound to cost more. Bond-Tech, however, promises to offer a bond swap evaluation aid program in the spring of 1986, priced under $1,000. With *FISTS*, this program should make a complete package for a variety of analysis and portfolio management tasks.

PBMS BOND-AID *PBMS Bond-Aid* from Distributed Micro Systems is designed to help you evaluate the effects of swapping positions in and out of your portfolio on taxes, income, and accrued interest. It's a reasonably priced package ($995) for low-volume investors.

Bond swaps take place when you sell one set of bonds and buy other bonds. They're usually done in conjunction with a tax-reduction strategy. Bond swapping can help you defer taxes, using the losses now to offset capital gains or ordinary income. Later when you sell the new securities, you'll have a lower tax basis.

The *Bond-Aid* package assumes that every swap has two sides: the current portfolio and an inventory of bonds on the open market that you can use to evaluate a bond swap. This inventory also could be a broker's unsold bonds. The bond swap part of the program maintains the bond descriptions in the portfolio and inventory files. You can change the descriptions as needed.

You can also alter such items as par value, the price, or commission rate of any issue on either side of the swap, and you can also add or delete issues from the swap at any time. Once the program has computed a swap that meets your requirements, a full report shows the details plus a line-by-line listing of all positions included in the swap.

PC MAGAZINE FACT FILE



PBMS Bond-Aid
Distributed Micro Systems
1499 Old Bayshore, #200
Burlingame, CA 94010
(415) 692-5855
List Price: $995
Requires: 256K RAM, one disk drive, DOS 3.0 or later.
In Short: A reasonably priced package for low-volume investors with a moderate level of experience who need yield calculations and swap analysis.

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PC MAGAZINE FACT FILE



CV Evaluator
Beta Systems
P.O. Box 1189 GMF
Boston, MA 02205
(617) 861-1655
List Price: $295
Requires: 256K RAM, graphics card.
In Short: A specialized program for analyzing a variety of convertibles; yields are computed as a part of portfolio analysis.

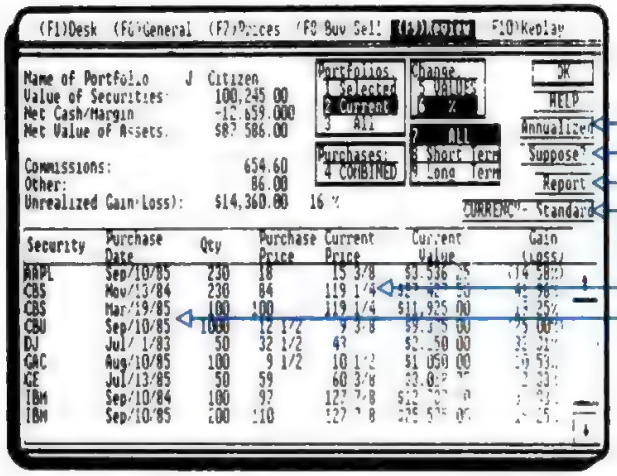
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The Bond Swap Summary Report, shown in Figure 6, gives you an excellent record of both the portfolio and the inventory side of the swap. The second page of the report breaks down each issue from both sides to show greater detail. Once you've seen the results of the swap, you might want to change the pricing or the commission rate and rerun the computations to see the effect. That way you can evaluate many swap combinations.

CV EVALUATOR *CV Evaluator* from Beta Systems is a specialized program for analyzing convertible bonds, which many knowledgeable people consider to be an ideal investment. Convertibles are debentures—bonds not secured by a particular asset but backed by the general creditworthiness of the issuing corporation—that you can convert into shares of the issuing company's stock at a predetermined rate and within a set period of time.

■ CV Evaluator analyzes convertible bonds, which many people consider to be ideal investments.

Convertibles offer fixed income with the possibility that the company's stock will rise in price, in which case you may convert your bonds into stock and take advantage of the stock's appreciation. Thus you can earn interest over a period of time while waiting for the price of the underlying stock to rise.

Investing in convertible bonds requires an analysis of both the company's stock and the bond's yield. You must consider the attractiveness of the issue in terms of its conversion value, and how the value of the convertible debenture ranks relative to other comparable securities.

The investment value of the underlying stock will be the element that you will be most interested in if you decide to invest in convertible debentures. First, the stock's potential for growth and earnings must meet your criteria. If it does, then you must

'sample ' BASE DATA Page 1

Company Name	Rate	Yr	Month	Rating	Shr/Bd	Com Div	Ind #	Data Symbol	Beta
BANK AM RLTY	9.500	8	7.50	BBB	32.26	2.040	5	BRE	0.80
BANK OF NY	12.000	6	12.00	A	40.60	1.840	3	BK	0.70
BARNETT BK	12.250	6	12.50	A	32.26	1.360	3	BBF	1.00
*CIGNA CORP	8.000	7	3.00	AA	23.36	0.600	2	PWJ	2.50
GREAT WSN FN	8.875	7	12.00	BB	32.79	0.880	4	GWF	1.20
KOGER PROPRT	9.250	3	7.50	BB	33.61	2.300	5	KDG	0.60
PAINE WEBBER	8.250	8	8.25	BBB	18.89	0.600	1	PWJ	2.50
US HOME	5.500	96	12.00	BB	84.39	0.160	6	UH	3.00
US LEASING	9.000	7	12.50	BBB	24.39	0.760	1	USL	1.20

'sample ' CALCULATED DATA Page 1

Company Name	Rate	Yr	Cv Price	Common Price	%	Prem	Cur Yld	YTM	Comm Yld	In Val	CIF
BANK AM RLTY	9.500	8	98.250	26.750	87.8	13.9	9.7	9.7	7.6	69	2.1
BANK OF NY	12.000	6	132.500	32.500	99.6	0.4	9.1	8.7	5.7	89	3.4
BARNETT BK	12.250	6	132.000	39.750	97.1	3.0	9.3	8.9	3.4	91	5.9
*CIGNA CORP	8.000	7	94.500	29.375	72.6	37.7	8.5	8.5	2.0	63	6.5
GREAT WSN FN	8.875	7	91.000	22.375	80.6	24.1	9.8	9.9	3.9	63	5.9
KOGER PROPRT	9.250	3	87.000	25.000	96.6	3.5	10.6	10.8	9.2	67	1.4
PAINE WEBBER	8.250	8	80.000	29.375	69.4	44.1	10.3	10.6	2.0	60	8.3
US HOME	5.500	96	71.000	6.500	77.3	29.4	7.7	9.6	2.5	51	5.2
US LEASING	9.000	7	103.000	36.625	86.7	15.3	8.7	8.7	2.1	66	6.6

Figure 8: *A list of convertible bonds screened by* CV Evaluator *for different ranges of yield to maturity, year of maturity, and quality rating.*

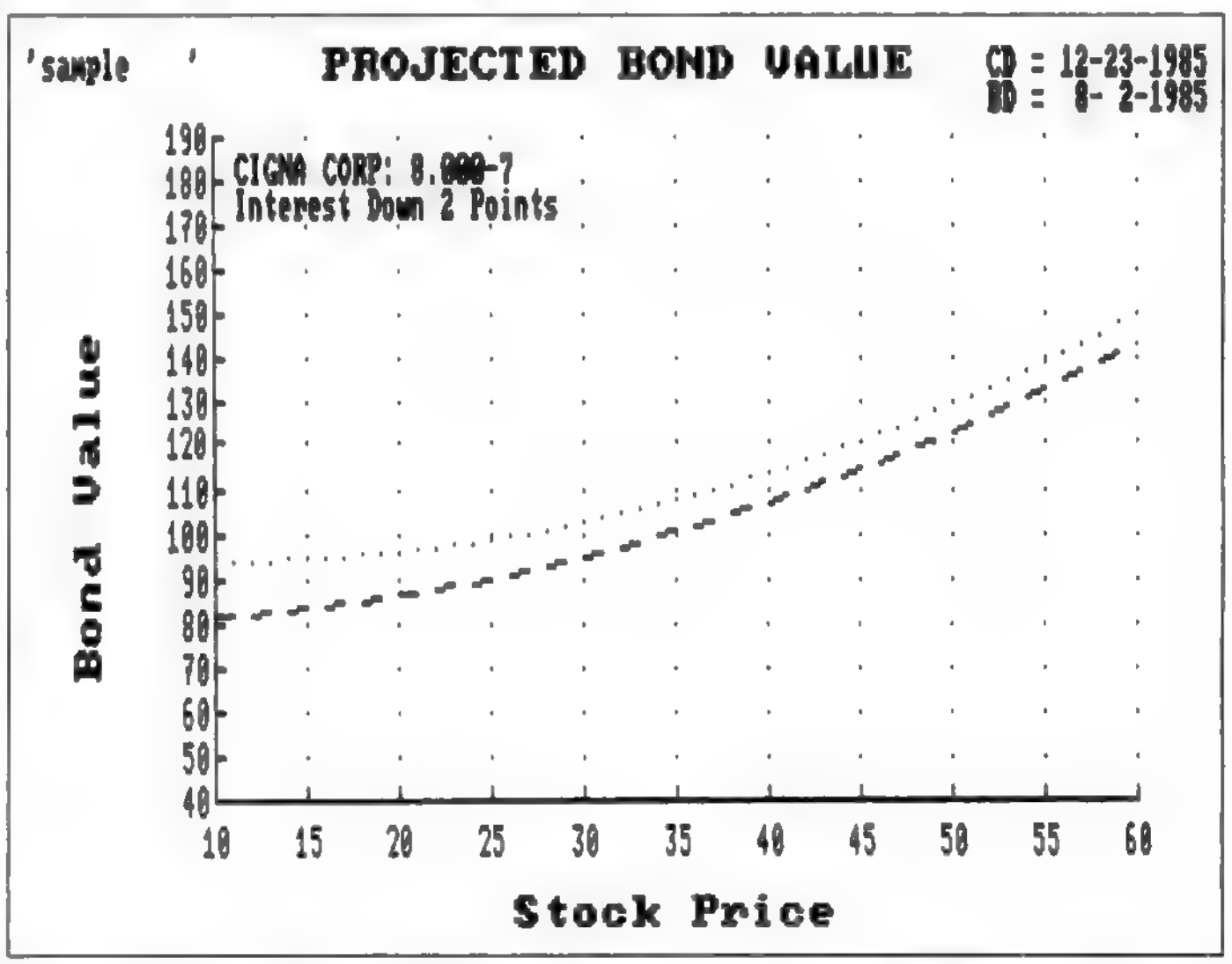


Figure 9: CV Evaluator *projects the value of a CIGNA Corp. convertible bond against the price of its underlying stock. The dotted upper curve shows the effect of assuming a −2 percent interest rate change and +50 percent stock price change.*



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Infoscope requires minimum 192K RAM (256K recommended), DOS 2.x-supported hard disk or two double-sided floppy disks.

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analyze the relative values of the common stock and the convertible bond, as well as the bond's yield to maturity. You do that by quantitatively estimating the future price of the bond on the basis of your expectations for interest rates and the growth of the underlying stock's price.

These complex computations require assistance from a computer program to produce more-accurate results and speed up the evaluation process. *CV Evaluator* is one such program. It correlates the yield to maturity to the "percentage" (the ratio of value of the underlying stock to the convertible price) for more than 100 selected convertible bonds and supplies this information monthly to *CV Evaluator* subscribers. Figure 7 is a scatter diagram of a file of convertible bonds screened by *CV Evaluator*. A list of convertible bonds the program screens for different ranges appears in Figure 8.

The graph of the correlations *CV Evaluator* performs characterizes the current convertibles market. Beta Systems calls the resulting curve of the correlation the "major fit." This correlation curve for convertible bonds corresponds to the yield curves for straight debt that plot yield to maturity against years to maturity (see Figure 7).

CV Evaluator can accommodate interest rate and underlying stock price changes so as to adjust the major fit to prevailing or projected market conditions. Price projections of a convertible are based on stock price and performance, and interest rate estimates. The program compares specific convertible bond characteristics with the major fit and calculates an "offset," which defines the difference between the major fit and a particular convertible bond.

Price projections for a specific convertible are based on this difference. You can plot the projected value of any convertible against the price of the underlying common stock on the basis of your own estimates of interest rates and trends. Figure 9 shows how *CV Evaluator* projects the value of a CIGNA Corp. convertible bond to the price of its underlying stock.

The monthly data that Beta Systems supplies to *CV Evaluator* subscribers includes market quotations, news items, quality ratings, betas, and major-fit correlation data. These monthly updates also set the base date on which all time value calculations are performed and predict the accuracy of *CV Evaluator*'s computations. Screening of the convertibles' databases is available according to your own criteria.

OTHER PROGRAMS Many other programs on the market are designed for the professional bond portfolio manager. They can be expensive investments in themselves, ranging in price from $295 to $4,950 depending on the design, but if you're interested in delving further, Fact Files for these programs are listed at left. Some of these other programs are *BondSwap Series* and *MicroBond Calculator* from Piedmont Software Co. of Charlotte, North Carolina, *Financial Software Series* from Technical Data Corp. of Boston, *Master Brain Bond Calculator* from Decision Programming Corp. of Rockville, Maryland, and *afs: TRADE* from Anderson Financial Systems Inc. of Rockville, Maryland. As with the three programs described here, comparing your specific objectives for fixed-income investing with a program's functions and price can help you determine which program can best help you face the complex investing challenges of analyzing and assessing bonds and other fixed-income or debt securities. PC

Fixed-Income Securities Software: Summary of Features

	FISTS	PBMS Bond-Aid	CV Evaluator
Price	$1,250	$995	$295
Yield calculation	Yes	Yes	Yes
Mortgage-backed securities	Yes	No	No
Financial futures	Yes	No	No
Bond swaps	No	Yes	No
Convertible issues	No	Yes	Yes
Experience required	Moderate/Heavy	Moderate	Moderate
Comments	A comprehensive set of programs for knowledgeable investors and professionals that analyzes different types of fixed-income securities.	A reasonably priced package for yield calculations and swap analysis suitable for low-volume traders.	A specialized program for analyzing a variety of convertibles. Yields are computed as part of portfolio analysis.

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Additional fixed-income securities packages similar to the ones reviewed here.

BondSwap Series
MicroBond Calculator
Piedmont Software Co.
1130 Harding Place
Charlotte, NC 28204
(704) 376-0935
List Price: $995–$4,950 for *BondSwap Series*, $350 for *MicroBond Calculator*
Requires: 128K RAM, two disk drives for *BondSwap*, one disk drive for *MicroBond*, DOS 2.0 or later.
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Financial Software Series
Technical Data Corp
330 Congress St
Boston, MA 02210
(617) 482-8799
List Price: $375 to $4,250
Requires: 192K RAM, one double-sided disk drive, DOS 1.1 or later.
CIRCLE 662 ON READER SERVICE CARD

Master Brain Bond Calculator
Decision Programming Corp
5640 Nicholson La., #103
Rockville, MD 20852
(301) 231-6393
List Price: $375
Requires: 128K RAM, one disk drive, DOS 2.0 or later.
CIRCLE 661 ON READER SERVICE CARD

afs: TRADE
Anderson Financial Systems Inc.
5010 Nicholson La
Rockville, MD 20852
(301) 468-3650
List Price: Varies, these are customized systems.
Requires: 256K RAM, two disk drives or a hard disk, DOS 2.0 or later.
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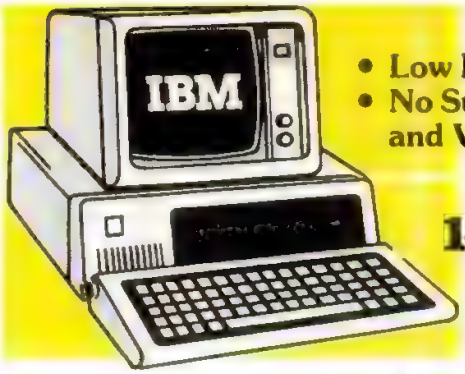
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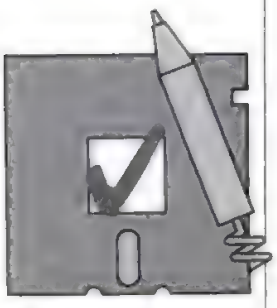
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Accidentally erase a file? Recovery is often possible using the DOS DEBUG command or with several commercial file recovery programs, such as The Norton Utilities or PC Tools.

You're likely to be less than delighted if a spreadsheet you've spent hours preparing can't be found when you call up the file a day later. Your mistake? The PC's?

It could be either one. Human error is the more common, often the result of a misguided or unintended ERASE (or DEL) command. But floppies and Winchesters don't last forever, and IBM's PC ATs seem especially vulnerable to hard disk maladies. Fortunately, in many cases there are methods of recovering seemingly lost files either through DOS or through a number of commercial programs, the best known of which is *The Norton Utilities*.

PREVENTIVE MEASURES If you always keep a duplicate of all your important files, blowing away the original is disheartening but hardly fatal. Some form of backup should be standard practice whether or not you have a hard disk. Make duplicates of each of your data disks every time you modify a file on it; reusing your next-to-last backup disk makes this practice both safe and economically feasible. And always keep a duplicate copy of your working program disks.

Be kind to your hard disks. Park them before moving your PC (use the SHIPDISK utility). Some hard disks, such as Compaq's, may have a metal locking tab that you push into place after removing the cover.

DUPLICATES ON-DISK Hard disk users can duplicate important files in more than one subdirectory. For instance, a common error is accidentally typing ERASE *.BAT to eliminate all backup files in a directory when ERASE *.BAK is meant. Keeping a duplicate copy of every batch file you normally use in a BAT_BACK subdirectory will help you recover almost painlessly from such a faux pas.

You can take more-drastic measures to prevent such mistakes by disabling DOS's ERASE and DEL commands. One way to do that is by editing COMMAND.COM to change the names of those commands to something untypable (like a string of smiling faces). Or you can just make the commands more difficult to indiscriminately peck into your keyboard by converting their names to strings of meaningless symbols. The method is explained in the accompanying sidebar, "Changing DOS Command Names to Prevent Accidental Erasures."

Another way to prevent accidental file damage is to make your most important files unerasable through the DOS facility of write-protection. DOS allows you to add a special, invisible code to directory entries of files that marks them as read-only. Files so marked cannot be written to, modified, or erased. Commercial programs, including *The Norton Utilities* and *PC Tools*, can make the attribute changes.

For readers without one of those utilities, we've written short programs to make files read-only, and one to restore them to read-write status. They're available on *PC Magazine*'s Interactive Reader Service as READONLY.COM and READWRIT.COM, respectively, or with documentation in the file READONLY.ASM.

■ A common error is accidentally typing ERASE *.BAT to eliminate all backup files in a directory when ERASE *.BAK is meant.

ERASED BUT NOT GONE No matter how many precautions you take, however, eventually you too will lose an important file. Fortunately, this does not always spell disaster. DOS does not immediately destroy an erased file. Rather, it just marks the directory entry of the file to show that it has been ordered erased and changes the file allocation table, or FAT (which tells DOS where every byte of a file is located on the disk), to allow the area occupied by the erased file's data to be reused. (Among other reasons, DOS saves time by merely marking dead files; it doesn't have to waste its milliseconds and energy changing thousands of bytes on the disk when modifying a few bytes in the directory and FAT will give the same effective result.)

When DOS erases a file, it changes the name it keeps in its file directory indicating erasure by substituting an ASCII E5 (Hex) (the lowercase Greek letter sigma [σ] for

the first letter of the filename. Further, it marks the disk space used by the file as blank by changing the appropriate entries in the disk FAT to zeros.

The net result is that the data once contained in an erased file remains intact as long as you do not write to the disk again. If you want to have any hope of getting back your data, the important rule to follow is *stop everything* as soon as you discover your mistake. *Do not write anything* to the disk that holds the blown-away file if you ever want to see your data again.

Overwriting one file with another of the same name will, in fact, destroy the previous file's directory information and, if the new file is about the same length as the old one, eliminate any hope of recovering the data in the old file. You cannot ordinarily recover a file that has been written over with one of the same name.

While the data is still encoded on the disk, you have some hope of getting it back. Alas, DOS provides no easy way of doing this. You might think that using RECOVER or CHKDSK with its /F (for Fix) option activated would help, but it won't. Worse, these programs write to the disk, so using them is likely to do more damage than good. RECOVER, in fact, often obliterates any hint of what files might have been erased from disk, making subsequent recovery of an erased file impossible.

The DOS utility DEBUG can help, however. You can use DEBUG to change the name of the erased file and revise the disk's FAT. This procedure, outlined below, is cumbersome and dangerous. Before starting, use DISKCOPY to make an exact duplicate of the disk (which will include the erased file), and work with the duplicate. That way a mistake in the recovery process won't damage the original. The DISKCOPY program will only read from the source disk (the one holding the erased file), so there is no risk of further harm to it during the duplication process.

Because of the massive amount of damage that can be done to hard disks when making a mistake with DEBUG, inexperienced users should never attempt using DEBUG on their Winchesters. However, if you are too desperate to be deterred by that warning, be sure to make a backup of your hard disk (streaming tape disk file by file is best, but a DOS backup on floppies will suffice) before you begin so that if your efforts go awry, you can restore everything from the backup copies.

UNERASING FILES MANUALLY

(1) The first step in unerasing a file using DEBUG is to find the file's entry in the disk directory and restore its name.

To do this, put a disk with DEBUG .COM on it in drive A: and a DISKCOPY of the disk containing the file to be unerased in drive B:. When the hyphen prompt appears on the screen after you start the DEBUG program from the A> prompt, type the command

```
L CS:Ø1ØØ 1 5 B <Enter>
```

L is the DEBUG Load command; the CS:0100 tells DEBUG where to load—in this case to the current Code Segment starting at memory location 100. The next three digits tell DEBUG what to load; 1 indicates drive B: (putting 0 in its place

Changing DOS Command Names to Prevent Accidental Erasures

Changing the names of DOS commands is not particularly difficult. First, with both DEBUG.COM and COMMAND.COM in your current directory, type DEBUG COMMAND .COM. In a moment, DOS will respond by putting a hyphen prompt on the screen. You can then use a few simple commands to change any byte in the COMMAND.COM disk file.

COMMAND.COM has a table of command names that it uses to match against what you type in. If you change a name in the table, DOS will recognize a different word as that command.

When you type the letter D at the DEBUG prompt, the program will display a section of the program (or any file) as both hexadecimal characters (the way your computer thinks) and as ASCII alphanumeric characters (the way you think). When you type D followed by a number in hexadecimal notation, DEBUG will display a section of code starting at that location.

In PC-DOS 3.1, the command ERASE is at location 4D29. (It is at 3AF5 in DOS 2.1 and other locations in different DOS versions.) Type D4D29 at the DEBUG hyphen prompt, press Enter, and you'll see ERASE and the 123 bytes of COMMAND.COM that follow (DEBUG displays 128 bytes at a time).

DEBUG command E edits (changes) individual bytes. Type E, followed by the location of the first byte you want to change, and what you want to change it to. Put text characters in between sets of single or double quotes, or separate the hexadecimal codes of the character you want to alter with commas.

Try typing E 4D29 'NEVER' and pressing Enter, and you'll change the name of the command ERASE to NEVER. If you try D 4D29 again after that command, you'll see NEVER has now replaced ERASE in the display.

To change ERASE to an untypable string of smiling faces and thus eliminate the possibility of ever erasing a file by mistake—or at all—try E 4D29 02,02,02,02,02. (02 is the ASCII code for a smiling face.)

At this point, you haven't done any damage. The changes you've made have taken place only inside your computer's memory; they do not affect the version of COMMAND.COM stored on-disk, which will continue to load unaffected by the changes you've thus far made.

To make your changes permanent, you must write them to disk using the DEBUG W (for Write) command, then pressing Enter. At that point, COMMAND.COM will be irrevocably modified, so make sure you have a backup copy of COMMAND.COM.

To leave DEBUG when you are finished with your modifications, type Q (for Quit) and press Enter. You'll discover that COMMAND.COM has been modified, and your changes will take effect the next time you boot up.

—Winn L. Rosch

Norton Utilities, Competitors, Speed File Recovery Process

Although the manual file recovery procedure I described in the main article works, a quick reading may show you that it's a particularly time-consuming and unrewarding job, considering that programs are available both free—from the *PC Magazine* Interactive Reader Service—and commercially that will handle all aspects of file unerasure quickly and automatically.

The free alternative is UNDEL .COM, a program written by Steven Holzner and listed in BASIC and assembly language in the Programming column of *PC Magazine* (Volume 4 Number 7, page 225) and available on the *PC Magazine* Interactive Reader Service, (212) 696-0360. UNDEL.COM automatically carries out the exact same procedure that you can do manually with DEBUG. Although entirely effective in most cases, it is limited in application to normal double-sided floppy disks and becomes less reliable when more than one file has been deleted from disk.

The commercial alternatives not only save the time and keystrokes necessary for entering the UNDEL program but are more powerful and more likely to restore files accidentally erased en masse.

Preeminent among the commercial entries are *The Norton Utilities*, which include 17 disk management programs. Although each of the utilities is in itself useful, when an erasure goes awry the godsend in the set is the main program, NU.COM. In the latest, 3.1 version, it's called QU.COM (Quick Unerase).

QU is designed to be fast and easy to use. When the program is called up, it searches the disk for erased files and quickly tries to unerase them. The only intervention it requires on your part is confirming that you want each particular file recovered and assigning a new initial letter to the filename.

QU exchanges its speed and ease of use for power. It has no provision for untangling the remnants of multiple erased files and will not even attempt to restore a file when part of it has been overwritten.

The principal utility, NU, will help you recover all the data that once made up a file as long as the data remains on the disk. Although the program's menu system proved somewhat complex in the past, Version 3.1 has been reworked so that the default options guide you swiftly through the file restoration process. By putting the process of selecting which data clusters go into which file, *Norton* can recover the remaining parts of files that have been partially overwritten and even untangle several tangled files that have been erased.

PC Tools from Central Point Software is a combination of reworked and improved DOS utilities and Norton-style

PC MAGAZINE FACT FILE

The Norton Utilities 3.1
Peter Norton
2210 Wilshire Blvd., #186-D
Santa Monica, CA 90403
(213) 826-8032
List Price: $99.95
Requires: 64K RAM, one disk drive, PC-DOS.
In Short: A collection of DOS utilities featuring both a quick unerase utility and a more extensive file recovery method. The most expensive, the best known, and still the best. Not copy protected.

CIRCLE 628 ON READER SERVICE CARD

PC Tools
Central Point Software
9700 SW Capitol Hwy., #100
Portland, OR 97219
(503) 244-5782
List Price: $39.95
Requires: 192K RAM (256K for RAM-resident mode), one disk drive, DOS 2.0 or later.
In Short: RAM-resident utilities similar to *The Norton Utilities*. The package also provides a menu-driven DOS shell for simplifying disk management. Not copy protected.

CIRCLE 629 ON READER SERVICE CARD

(continues)

would indicate drive A: as the source). The 5 and B indicate which disk sectors to load. The numbers given correspond to the first and last sectors of the directory on double-sided, double-density floppy disks (B is hexadecimal for 11).

Next display the directory by typing the D command and pressing Enter. DEBUG will then show the directory of drive B: in hexadecimal and ASCII form, four entries at a time.

Repeat the D command to scroll through all of the directory entries. Eventually, you will find your erased file, identifiable by its initial "." (a period) and the hexadecimal code E5. (The DOS 3.1 version of DEBUG translates the lowercase sigma that corresponds to the ASCII code E5 into a period; DOS 2.1 DEBUG displays it as a lowercase "e".)

To unerase this file, you must first change the period or e to an uppercase character (or to one of the other characters DOS allows in filenames).

Use the DEBUG Edit command to change this character by simply typing E, followed by the number just to the left of the row in which the filename appears (that number corresponds to the memory location of the period or lowercase e), followed by the uppercase letter (inside single quotes) you wish to substitute. Then press Enter. Your line should look like this:

```
E 0320 'X' <Enter>
```

(2) The next step is to locate all the data clusters associated with the file.

The disk directory codes information that is very important in finding these data clusters.

The 11th and 12th bytes (the hexadecimal characters) on the row immediately below the filename you want to unerase indicate the starting cluster number of the disk sectors used by the file. The last four bytes on the line code the length of the file in bytes. Write these numbers down on a piece of paper so that you can remember them. (The rest of the numbers in the directory entry code the time-and-date stamp of the file and the file status.)

DOS usually stores numbers with their least significant bytes first—that is, what to us seems in backward order—so you must first convert the cluster number given in the directory to a more familiar form.

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■ PC LAB NOTES

The last digit of the 12th byte in the second row of the directory entry is the first digit of the cluster number. The two characters in the 11th byte (yes, the preceding byte!) are the next two digits, in order. Hence, the bytes 12 34 code cluster number is 34 12, in hexadecimal notation.

You also need to know how many clusters you have to find. To determine the number of clusters used by the erased file from the file length coded in the directory entry—a number that is given in bytes—first reverse their order to correct for DOS's least-significant-byte-first style. Divide the resulting number by the number of bytes in a cluster—400 hexadecimal if you are using double-sided, double-density disks or 200 if you are using single-sided disks.

If the result is greater than 1, you must write your revised directory to disk, then find that number of additional sectors by examining the file allocation table. If the file occupies only one cluster, you need only write the revised directory to disk to finish recovering the entire file.

(3) Write the directory in which you've restored the filename to disk by repeating your first Load command but substituting the Write command, W, for L. Thus:

```
W CS:0100 1 5 B <Enter>
```

(4) If more than one cluster was required to store your file, next you must load and edit the file allocation table. Type the following instruction:

```
L CS:0000 1 1 4 <Enter>
```

This loads the file allocation table from disk B: at location 0000 in the current code segment. The 0000 location will make your math a bit easier later on.

Type D 0000 to display the first 128 bytes of the FAT. Verify that you have loaded the FAT by examining the first three bytes. The first byte should be FF, FE, FD, or FC, and the following two bytes should be FF.

DOS uses a byte and a half to encode each FAT entry, three digits in the DEBUG display, one byte (two digits), and half of another byte. Even-numbered clusters consist of a byte and the last digit of the following byte. Odd-numbered clusters consist of the first half of a byte and the following whole byte. Again, the least significant byte, or part of a byte, is displayed first. Hence, if the display shows the sequence 12 34 56, it would actually point to clusters numbered 412 and 563 if the location of the 12 corresponds to the first part of an even cluster.

Each group of three digits in the FAT indicates a logical cluster on the disk that corresponds to the location of the cluster number in the sequence of digits in the FAT. DOS uses the cluster location to store the number corresponding to the next cluster in the file. Thus, each cluster contains the number of the following cluster of the file.

DOS uses a few special codes. A group of three zeros indicates a blank or erased cluster. A number between FF8 and FFF inclusive indicates that the cluster is the last one in a file. The number FF7 indicates that the cluster contains a bad sector and thus cannot be used for data storage.

Find the FAT entry for the first cluster of the file you want to restore by multiplying the cluster number you wrote down from the directory by 1.5.

If the result is a whole number, the FAT entry consists of the corresponding byte and the last digit of the following byte.

If the result is not a whole number, ignore the remainder of 0.5. The FAT entry then consists of the first digit of the byte at

("Norton Utilities, Competitors . . ." sidebar continued)

functions with a novel twist. The *PC Tools* program can be made memory resident so that it can be called up from the middle of another application merely by pressing Ctrl and Esc simultaneously. It will coexist in memory with resident programs like *SideKick* and *ProKey*.

PC Tools functions include enhanced directory displays with subdirectory tree and status displays; file copying, comparing, renaming, searching, and viewing/editing; and displays of disk technical information and a print utility.

Like the principal Norton program, the Undelete PCTools option lets you sort through chunks of data to sort out intertwined erased files and recover pieces of files that have been partially overwritten. When the damage is minimal—a single file accidentally erased—the process is simple and automatic, just a query system.

Although either the Norton or Central Point product will solve your accidental erasure problems, *The Norton Utilities* are more powerful (as well as more expensive).

Two other file recovery utilities are *File Recovery System* from Brown Bag Software and *Disk Mechanic* from MLI Microsystems. For a comparative review, see "Norton Utilities: Still the Best?" (*PC Magazine*, Volume 5 Number 3, page 54). Two other unerase utilities are Unicorn Systems' *Diskmap* and Powersoft Products' *Super Utility*.

—Winn L. Rosch

PC MAGAZINE FACT FILE

File Recovery System
Brown Bag Software
15100 El Camino Grande
Saratoga, CA 95070
(408) 395-9568
List Price: $49.95
Requires: 128K RAM, one disk drive, DOS.
In Short: File recovery combined with drive management and control functions. Not copy protected.

CIRCLE **630** ON READER SERVICE CARD

Disk Mechanic
MLI Microsystems
P.O. Box 825
Framingham, MA 01701
(617) 926-2055
List Price: $70
Requires: 192K RAM (PC or XT); 256K RAM (PC AT); 320K RAM (Compaq); one disk drive; DOS.
In Short: File recovery is a side feature of this floppy-disk copying program. Copy protected.

CIRCLE **631** ON READER SERVICE CARD

Diskmap 2.0
Unicorn Systems Co.
3807 Wilshire Blvd.
Los Angeles, CA 90010
(800) 222-6974
(213) 380-6974
List Price: $59
Requires: 64K RAM, one disk drive, DOS.
In Short: This collection of utilities displays a range of disk storage data, including the contents of file allocation tables, in addition to its Unerase functions.

CIRCLE **632** ON READER SERVICE CARD

■ PC LAB NOTES

the corresponding location in the FAT and the following byte.

You can have DEBUG find this entry for you by typing the D command, followed by the FAT entry location you determined by multiplying the cluster number by 1.5, and pressing Enter. This entry should be all zeros.

Next find the first series of three zeros in the FAT, ignoring the starting location you just found. In most cases, this will be the next cluster in the file you are attempting to unerase. Copy the cluster number of this location into the FAT entry of the first cluster of the file you previously found using the DEBUG Edit command. Don't forget to use the FAT's unusual ordering of the digits of the cluster number.

Find the next series of three zeros and put its cluster number into the digits at the location of the previous cluster. Continue with this procedure until you reach the number of clusters specified by the file length in the directory. Replace the zeros that occur at the location of the last cluster number with FFF to indicate to DOS that it is the last cluster in the file.

DOS keeps two copies of the FAT, so you should duplicate your revised FAT at the second location. The DEBUG Move command, M, will speed this process. Type the following instruction, and your new FAT will be duly duplicated:

```
M 0000 0400 0400
```

Finally, write both copies of your revised file allocation table to disk using the following command:

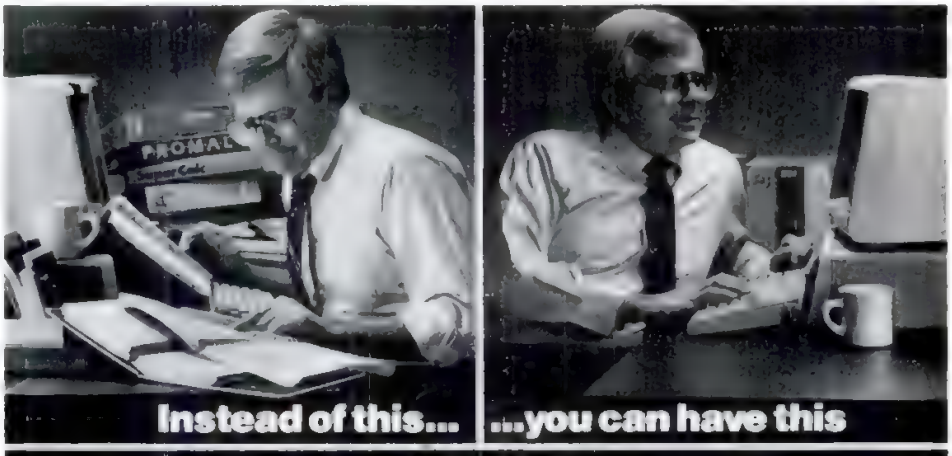
```
W CS:0000 1 1 4<Enter>
```

You now have a chance that your file has been restored. If you were careful with your math and mistakenly erased only one file, your data is back, ready for you to work on it again. In more-complex situations, you'll discover that file recovery utilities are worth their modest prices.

ADVANCED USER'S HINT You can easily find subdirectory entries you need to unerase by using DEBUG to change the attribute byte of the subdirectory's entry in its root directory, then loading the directory into DEBUG as if it were a file.

Normal files usually have an attribute byte of 20 (unless they have been previously backed up). The attribute byte of a subdirectory is 10. Edit the 10 of the subdirectory you want to view to a 20, and DEBUG can easily access its contents as if the subdirectory were an ordinary file. Be sure to change the attribute byte back to 10 when you are done.

Winn L. Rosch is a contributing editor of PC Magazine.



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■ PROGRAMMING/UTILITIES ■ JOHN DICKINSON

RENDIR UNTO \CAESAR



DOS lets you RENname files but not the subdirectories that hold them. RENDIR.COM lets you change directory names under DOS 3.0 or later.

One of DOS's minor annoyances is that the system isn't designed to allow you to rename subdirectories. To change a subdirectory's name to a more appropriate designation, you have to create a new directory altogether, copy all the files from the old one into it, delete them from the old directory, and, finally, remove the previous directory. That's a real nuisance, made doubly bothersome because intuitively you'd think that DOS would let you simply use the RENAME command on a subdirectory. After all, a subdirectory is just another file (albeit with a special purpose), so why shouldn't you be able to rename it?

When I first tried to write an assembler program to rename subdirectories under PC-DOS 2.0 and 2.1, I quickly found out why there is no regular user command to let you do it. It turned out that neither of the PC-DOS File Rename functions (17H and 56H, which are available through Interrupt 21H), was able to rename a subdirectory. Why those function calls were restricted in that way was not clear, but at least it was clear that the PC-DOS command processor (COMMAND.COM) had no facilities available to it for renaming subdirectories.

With PC-DOS Version 3.0 (which was introduced in August 1984, when the PC AT was announced), however, suddenly Function 56H became able to rename a subdirectory. The PC-DOS user commands still didn't include one for renaming a subdirectory, but at least the system functions allowed an assembler programmer to do it. So I wrote a command called RENDIR, which stands for RENname DIRectory. (In PC-DOS 3.0—but only in that version—you can, as an alternative to using an assembly language program, use BASICA to NAME *olddir* AS *newdir*. This is actually a bug in DOS, however, that has been fixed in PC-DOS 3.1. With Version 3.1—and presumably henceforth—a program such as RENDIR is necessary.)

The assembler listing for RENDIR is shown in Figure 1. The program can be assembled using any of the available IBM

```
RENDIR segment para public 'code'
        assume  cs:RENDIR, ds:RENDIR, es:RENDIR, ss:NOTHING
        org     100h                    ; .COM format
BEGIN:
        jmp     CODE_START              ; Jump around data declarations
DECLARE:        ; Equates and Storage allocation for messages & data areas
        COPYRIGHT       db      'RENDIR (C) 1986, Ziff-Davis Publishing Co.'
                        db      13,10,'$'
        PATH_FILE_LEN   equ     77  ;Length = 1, Path = 63, FileName = 12, 0 = 1
        SOURCE_NAME     db      PATH_FILE_LEN dup (0)
        TARGET_NAME     db      PATH_FILE_LEN dup (0)
        TARGET_END      dw      $ - 1
        VALID_IN        db      '/abcdefghijklmnopqrstuvwxyz,;=',9
        VALID_OUT       db      '\ABCDEFGHIJKLMNOPQRSTUVWXYZ',4 dup(32)
        VALID_NUM       equ     $ - VALID_OUT - 1
        ERR_HEAD        db      10,13,'RENDIR Error - $'
        BAD_VERSION     db      'Must be PC-DOS 3.0 or Higher$'
        NO_PARMS        db      'Correct Syntax is:',13,10,10
                        db      'RENDIR [D:][Source_Path]Source_Name[.Ext] '
                        db      'Target_Name[.Ext]$'
        NO_TARGET       db      'No Target Name Specified$'
        BAD_TARGET      db      'Invalid "\" or ":" in Target Name$'
        DIR_NOT_FOUND   db      'Source Directory Not Found$'
        NOT_DIRECTORY   db      'Source File Not a Directory$'
        PATH_NOT_FOUND  db      'Source or Target Path Not Found$'
        ACCESS_DENIED   db      'Access to Target Denied or Target Exists$'
        PC_DOS_2_PATCH  db      13,10,'or $'
        DRIVES_CONFLICT db      'Source and Target Disk Drives Conflict$'
        UNDEFINED_ERR   db      'Undefined Error: PC-DOS Function 56H$'
        ERR_TAIL        db      10,10,13,' . . . Aborting',10,13,13,'$'
        GOOD_MSG1       db      10,13,'Directory "$'
        GOOD_MSG2       db      '" . . renamed to . . "$'
        GOOD_MSG3       db      '"$'
        END_LINE        db      10,13,'$'
CODE_START:     ; Processing logic starts here
        mov     dx,offset COPYRIGHT     ; Display copyright notice
        mov     ah,9h                   ; Request display string
        int     21h                     ; Call PC-DOS
        mov     ah,30h                  ; Request PC-DOS version
        int     21h                     ; Call PC-DOS
        cmp     al,3                    ; Must be 3.0 or higher
        jae     VERSION_OK              ; If it is, keep going
        mov     dx,offset BAD_VERSION   ; Otherwise, exit with error
        jmp     ERROR_EXIT
VERSION_OK:     ; Parse command line into source name and target name
        mov     si,80h                  ; PSP parameter byte count pointer
        mov     cl,[si]                 ; Move byte count to CL
        xor     ch,ch                   ; Zero CH
```

(Figure 1 continues)

Figure 1: *The assembler listing for RENDIR.COM.*

■ PROGRAMMING/UTILITIES

```
        jcxz    PARMS_NO_GOOD           ; If CX is zero, there are no parameters
        mov     dx,cx                   ; Save byte count in dx
        inc     si                      ; Point to parameter area
        mov     di,si                   ; Copy SI to DI for cleanup routine
        cld                             ; Set direction flag to forward
CLEAN_PARMS:    ; Change valid delimiters to blanks, lower to upper case
        lodsb                           ; Load each character to AL
        push    di                      ; Save DI on stack
        mov     di,offset VALID_IN      ; Point to table of valid inputs
        push    cx                      ; Save CX on stack
        mov     cx,VALID_NUM            ; Set CX to number of inputs to look for
repne   scasb                           ; See if any are in AL
        jcxz    CLEAN_END               ; If not, change nothing
        mov     bx,VALID_NUM            ; Set up BX to point to valid output
        sub     bx,cx                   ; This will leave BX one off
        mov     al,VALID_OUT [bx - 1]   ; Load the valid output to AL
CLEAN_END:
        pop     cx                      ; Restore CX
        pop     di                      ; Restore DI
        stosb                           ; Store modified AL back to PSP
loop    CLEAN_PARMS                     ; Loop until CX is zero
        mov     cx,dx                   ; Restore number of bytes in PSP to CX
        mov     dx,2                    ; Set DX to look for up to 2 parameters
        mov     bx,offset SOURCE_NAME   ; Set BX to address of 1st parameter
        mov     al,' '                  ; Set up to scan for first non-blank
        mov     di,81h                  ; Set DI to PC-DOS parameter pointer
FIND_PARMS:     ; Start looking for parameters, load to program storage
repe    scasb                           ; Scan while blanks
        mov     si,di                   ; Set SI to second non-blank byte
        dec     si                      ; Adjust it to first non-blank byte
        inc     cx                      ; Adjust CX to compensate
        jcxz    PARMS_LOADED            ; If CX is zero, no parameters left
        mov     di,bx                   ; Set DI to parameter hold area
        mov     ax,cx                   ; Store CX to first byte of hold area
        stosb                           ; DI is adjusted to second byte here
STORE:  lodsb                           ; Load each byte to AL
        cmp     al,' '                  ; Is it a blank?
        jz      END_STORE               ; Yes, end of this parameter
        stosb                           ; No, store the byte to hold area
END_STORE:
        loopnz  STORE                   ; Keep looking
        sub     [bx],cx                 ; Store number of bytes in each
        jcxz    PARMS_LOADED            ; If CX is zero, no more parameters
        dec     byte ptr [bx]           ; parameter to first byte of hold area
        mov     di,si                   ; Set up to scan for next non-blank
        dec     di                      ; Adjust DI to point to the blank
        inc     cx                      ; Adjust CX to compensate
        dec     dx                      ; Decrement DX counter
        cmp     dx,0                    ; Is DX zero?
        jz      PARMS_LOADED            ; Yes, all expected parameters loaded
        add     bx,PATH_FILE_LEN        ; No, point to next part of hold area
        jmp     FIND_PARMS              ; Go back and look for more
PARMS_LOADED:                           ; All parameters are loaded
        cmp     SOURCE_NAME[0],0        ; If there are no bytes in the
        je      PARMS_NO_GOOD           ; SOURCE_NAME, no parameters present
        cmp     TARGET_NAME[0],0        ; Same for TARGET_NAME
        ja      CHECK_PARMS
PARMS_NO_GOOD:                          ; Exit with an error if there
        mov     dx,offset NO_PARMS      ; are no or incorrect parameters passed
        jmp     ERROR_EXIT
CHECK_PARMS:                            ; Check for '\' or ':' in target name
        mov     di,TARGET_END           ; Point DI to end of parameter area
        mov     si,offset TARGET_NAME   ; Point SI to number or bytes area
        lodsb                           ; Load number of bytes to AL
        xor     ah,ah                   ; Zero AH
        mov     cx,ax                   ; Move to CX for loop
        push    cx                      ; Save CX on stack
        add     si,cx                   ; Adjust SI to end of target name
        dec     si                      ;
        std                             ; Set direction flag to reverse
MOVE_TARGET:                            ; Move target to end of area while
        lodsb                           ; checking for '\'
        cmp     al,'\'
        je      BAD_TARGET_FOUND        ; If found, target is bad
        cmp     al,':'
        je      BAD_TARGET_FOUND
        stosb                           ; Store byte to end of area
        loop    MOVE_TARGET             ; Keep looking
        add     di,1                    ; Adjust DI
        push    di                      ; Save DI on stack
        jmp     FIND_SOURCE_DIR         ; Go process source name
BAD_TARGET_FOUND:                       ; Exit with error if target
        mov     dx,offset BAD_TARGET    ; contains a '\'
        jmp     ERROR_EXIT
FIND_SOURCE_DIR:                        ; Look for end of path name in source
        mov     si,offset SOURCE_NAME   ; Point SI to number of bytes
        lodsb                           ; Load number of bytes to AL
        xor     ah,ah                   ; Zero AH
        mov     di,si                   ; Move SI to DI for scan
```

(Figure 1 continues)

assemblers. After LINKing it, use EXE-2BIN to convert it to a .COM file format. Remember to rename the resulting .BIN file to .COM. As an alternative, a BASIC program that will automatically create RENDIR.COM when you run it once under BASICA is shown in Figure 2. If you prefer using your modem to typing, all three versions of RENDIR (the .COM, .ASM, and .ASC [which you REName to .BAS after receiving]) are available for downloading from *PC Magazine*'s Interactive Reader Service (212-696-0360). RENDIR.COM has only one quirk—namely, that you shouldn't try to rename the subdirectory you are currently in. I'll explain this more fully further on, and perhaps it will give you a clue as to why PC-DOS didn't include its own RENDIR command. First, let me walk you through the RENDIR program itself.

HOW IT WORKS The RENDIR program (see Figure 1) starts out by displaying a copyright message and checking to see that the version of PC-DOS in use is 3.0 or later. After that, most of the program is involved with parsing the parameters input on the command line to make sure they comply with RENDIR's syntax rules. The parsing strategy starts out by converting all lowercase letters to uppercase letters converting all valid delimiters to blanks, and changing any forward slashes (/) to backslashes (\). After that, the parameters (only two are checked for) are moved into the SOURCE_NAME and TARGET_NAME memory areas for further processing. RENDIR checks to make sure that two parameters were specified and, if not, exits with an error message that documents RENDIR's syntax.

TARGET_NAME is then checked (starting at label CHECK_PARMS) for any colons (:) or backslashes that are not allowed by RENDIR's syntax. (Remember, disk drive and subdirectory specifications are not allowed in the target name.) At the same time, the new subdirectory name data is moved into the end of the TARGET_NAME memory area to make room for the pathname and/or disk drive specification (if any) specified in the SOURCE_NAME.

SOURCE_NAME is checked (starting at label FIND_DIRECTORY) to see if a

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■ PROGRAMMING/UTILITIES

```
        mov     cx,ax                   ; Move AX to CX for scan repeat
        add     di,cx                   ; Adjust DI to end of source name
        dec     di                      ;
        mov     al,'\'                  ; Scan for '\'
repnz   scasb
        cld                             ; Set direction flag to forward
        jnz     NO_DIR                  ; Directory is in current directory
        dec     cx                      ; Adjust CX
        mov     di,offset TARGET_NAME + 1       ; Point DI to target name
        mov     si,offset SOURCE_NAME + 1       ; Point SI to source name
rep     movsb                           ; Move path name to target name
        jmp     MOVE_NAME               ; DI points to position for target name
NO_DIR:                                 ; No path, point to beginning of name
        cmp     SOURCE_NAME[2],':'      ; Check for disk drive specification
        jne     NO_DISK
        mov     di,offset TARGET_NAME + 1       ; Point DI to target name
        mov     si,offset SOURCE_NAME + 1       ; Point SI to source name
        mov     cx,2                    ; Move the two bytes into target name
rep     movsb                           ; that contain disk drive specification
        jmp     MOVE_NAME
NO_DISK:
        mov     di,offset TARGET_NAME + 1
MOVE_NAME:                              ; Move target name to correct position
        pop     si                      ; Restore saved DI in SI
        pop     cx                      ; Restore CX
rep     movsb
        mov     al,0                    ; Finish ASCIIZ string with a binary 0
        stosb
FIND_DIRECTORY:                         ; Does source directory exist?
        mov     dx,offset SOURCE_NAME+1 ; DX points to SOURCE_NAME
        mov     ah,4eh                  ; Request find file
        mov     cx,10h                  ; Set attribute for directories
        int     21h                     ; Call PC-DOS
        jnc     FOUND_FILE              ; If no error, a file was found
        jmp     NO_DIRECTORY
FOUND_FILE:
        mov     si,95h                  ; Position of attribute byte in DTA
        lodsb                           ; Load attribute byte to AL
        and     al,10h                  ; Check to see if it's a directory
        jnz     RENAME_DIRECTORY        ; If not zero, it's a directory
        mov     dx,offset NOT_DIRECTORY
        jmp     ERROR_EXIT
NO_DIRECTORY:                           ; Exit with error if no directory
        mov     dx,offset DIR_NOT_FOUND ; If file not found, exit
        jmp     ERROR_EXIT              ; program with error message
RENAME_DIRECTORY:
        mov     dx,offset SOURCE_NAME + 1       ; DX points to old file name
        mov     di,offset TARGET_NAME + 1       ; DI points to new file name
        mov     ah,56h                  ; Request rename file
        int     21h                     ; Call PC-DOS
        jnc     GOOD_RENDIR             ; If no error, call was successful
        cmp     ax,3                    ; Check for error 3 (path not found)
        jne     ERR_5
        mov     dx,offset PATH_NOT_FOUND
        jmp     ERROR_EXIT              ; Exit program with error message
ERR_5:  cmp     ax,5                    ; Check for error 5 (file inaccessible)
        jne     ERR_17
        mov     dx,offset ACCESS_DENIED
        jmp     ERROR_EXIT
ERR_17: cmp     ax,17                   ; Check for error 17 (drive conflict)
        jne     UNDEF
        mov     dx,offset DRIVES_CONFLICT
        jmp     ERROR_EXIT              ; Exit program with error message
UNDEF:  mov     dx,offset UNDEFINED_ERR ; Undefined error from function 56H
        jmp     ERROR_EXIT              ; Exit program with error message
GOOD_RENDIR:                            ; Exit with message

        mov     ah,9h                   ; Request display string
        mov     dx,offset GOOD_MSG1     ; Display GOOD_MSG1
        int     21h                     ; Call PC-DOS
        mov     cx,2                    ; 2 fields - source & target file
        mov     bx,offset SOURCE_NAME + 1       ; Point to source file
START1: mov     si,bx                   ; Copy BX to SI
START2: lodsb                           ; Load each byte to AL
        cmp     al,0                    ; If ASCII 0, end of field
        je      BETWEEN
        mov     dl,al                   ; Copy byte to DL for funciton 2H
        mov     ah,2h                   ; Request display one byte
        int     21h                     ; Call PC-DOS
        jmp     START2                  ; Get next character
BETWEEN:cmp     cx,2                    ; Is it first or second field?
        jne     CR_LF                   ; If second, display end of message
        mov     ah,9h                   ; Request display string
        mov     dx,offset GOOD_MSG2     ; Display GOOD_MSG2
        int     21h                     ; Call PC-DOS
        jmp     NEXT                    ; Go process next field
CR_LF:  mov     ah,9h                   ; Request display string
        mov     dx,offset GOOD_MSG3     ; Display GOOD_MSG3
```

(Figure 1 continues)

path or disk drive was specified. If it was, it is copied into the beginning of TARGET_NAME. Then (at label MOVE_NAME) the new subdirectory name data is moved back to connect it to the path or disk drive data. A byte of binary zeros is moved in after the new subdirectory name specification to make sure it complies with ASCIIZ string rules.

PC-DOS Function 4EH (find file) is used to see if the source subdirectory exists. This requires setting the attribute byte in the CX register to include subdirectories in the search before the function is called. After the call, the attribute byte in the Disk Transfer Area has to be checked. This is because when attributes are specified for non-normal files, Function 4EH's search is inclusive and may return normal files as well. If the filename does not exist or if the filename exists but is not a subdirectory, RENDIR simply issues an error message and exits.

From there on, the program is easy to follow. Function 56H is called to do the renaming, and error return codes are checked for. If no error occurred (that is, the carry flag is clear), RENDIR prompts the user with a confirmation message and exits. If there was an error, RENDIR does its best to explain what happened and then exits.

USING RENDIR It's always a good idea to design the syntax for your own commands to be like that of PC-DOS commands that have similar functions, and RENDIR is designed to mimic the syntax of the RENAME (files) command. Thus, RENDIR's general syntax is

```
RENDIR [d:][path]sourcename[.ext] targetname[.ext]
```

Like RENAME, RENDIR does not allow changing the disk or directory in which the subdirectory to be renamed exists. This was done as much for syntax consistency as for the fact that Function 56H does not allow subdirectories to be moved to another directory when they are renamed. (See my discussion of the REDirect program in *PC Magazine*, Volume 4 Number 4, on this, but do *not* use the RED.ASM listing shown there, which suffered major printing errors. If you want that program, get the corrected .ASM or .COM version by modem from PC-IRS, or send a self-ad-

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■ PROGRAMMING/UTILITIES

```
        int     21h                     ; Call PC-DOS
        mov     dx,offset END_LINE      ; Terminate display line
        mov     ah,9h                   ; Request display string
        int     21h                     ; Call PC-DOS
NEXT:   add     bx,PATH_FILE_LEN        ; Move BX to point to next field
        loop    STARTI                  ; Loop for second field
        jmp     EXIT                    ; Exit RENDIR
ERROR_EXIT:                             ; Print Error Message and Exit
        push    dx                      ; Save error message pointer on stack
        mov     ah,9h                   ; Request display string
        mov     dx,offset ERR_HEAD      ; Display error header
        int     21h                     ; Call PC-DOS
        pop     dx                      ; Display error message
        int     21h                     ; Call PC-DOS
        mov     dx,offset ERR_TAIL      ; Display error tail
        int     21h                     ; Call PC-DOS
EXIT:   int     20h                     ; Exit to PC-DOS
RENDIR  ends
        end     BEGIN
```

(Figure 1 ends)

```
100 ' Program for creating RENDIR.COM
110 CLS:PRINT "Checking DATA; please wait..."
120 FOR B=1 TO 72
130 FOR C=1 TO 17
140 READ A$:IF C<17 THEN 160
150 Z#=Z#+VAL(A$)
160 NEXT:NEXT
170 IF Z#=93811 THEN RESTORE:GOTO 200
180 PRINT "ERROR:  CHECK THE LAST NUMBER IN"
190 PRINT "EACH DATA STATEMENT--THEN REDO":END
200 FOR B=1 TO 72
210 FOR C=1 TO 16
220 READ A$:TTL=TTL+VAL("&H"+A$)
230 NEXT
240 READ S:IF S=TTL THEN 270
250 PRINT "DATA ERROR IN LINE";B*10+330
260 PRINT "CHECK FIGURES AND REDO":END
270 TTL=0:NEXT:RESTORE
280 OPEN "RENDIR.COM" AS #1 LEN=1:FIELD #1,1 AS D$
290 FOR B=1 TO 72
300 FOR C=1 TO 16
310 READ A$:LSET D$=CHR$(VAL("&H"+A$))
320 PUT #1:NEXT:READ DUMMY$:NEXT:CLOSE
330 PRINT "RENDIR.COM CREATED"
340 DATA E9, D4, 02, 52, 45, 4E, 44, 49, 52, 20, 28, 43, 29, 20, 31, 39, 1217
350 DATA 38, 36, 2C, 20, 5A, 69, 66, 66, 2D, 44, 61, 76, 69, 73, 20, 50, 1245
360 DATA 75, 62, 6C, 69, 73, 68, 69, 6E, 67, 20, 43, 6F, 2E, 0D, 0A, 24, 1288
370 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
380 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
390 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
400 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
410 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
420 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
430 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
440 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
450 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 0
460 DATA 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, C9, 01, 2F, 61, 62, 63, 543
470 DATA 64, 65, 66, 67, 68, 69, 6A, 6B, 6C, 6D, 6E, 6F, 70, 71, 72, 73, 1720
480 DATA 74, 75, 76, 77, 78, 79, 7A, 2C, 3B, 3D, 09, 5C, 41, 42, 43, 44, 1364
490 DATA 45, 46, 47, 48, 49, 4A, 4B, 4C, 4D, 4E, 4F, 50, 51, 52, 53, 54, 1224
500 DATA 55, 56, 57, 58, 59, 5A, 20, 20, 20, 20, 0A, 0D, 52, 45, 4E, 44, 973
510 DATA 49, 52, 20, 45, 72, 72, 6F, 72, 20, 2D, 20, 24, 4D, 75, 73, 74, 1279
520 DATA 20, 62, 65, 20, 50, 43, 2D, 44, 4F, 53, 20, 33, 2E, 30, 20, 6F, 1005
530 DATA 72, 20, 48, 69, 67, 68, 65, 72, 24, 43, 6F, 72, 72, 65, 63, 74, 1503
540 DATA 20, 53, 79, 6E, 74, 61, 78, 20, 69, 73, 3A, 0D, 0A, 0A, 52, 45, 1173
550 DATA 4E, 44, 49, 52, 20, 5B, 44, 3A, 5D, 5B, 53, 6F, 75, 72, 63, 65, 1359
560 DATA 5F, 50, 61, 74, 68, 5D, 53, 6F, 75, 72, 63, 65, 5F, 4E, 61, 6D, 1589
570 DATA 65, 5B, 2E, 45, 78, 74, 5D, 20, 54, 61, 72, 67, 65, 74, 5F, 4E, 1456
580 DATA 61, 6D, 65, 5B, 2E, 45, 78, 74, 5D, 24, 4E, 6F, 20, 54, 61, 72, 1394
590 DATA 67, 65, 74, 20, 4E, 61, 6D, 65, 20, 53, 70, 65, 63, 69, 66, 69, 1476
600 DATA 65, 64, 24, 49, 6E, 76, 61, 6C, 69, 64, 20, 22, 5C, 22, 20, 6F, 1283
610 DATA 72, 20, 22, 3A, 22, 20, 69, 6E, 20, 54, 61, 72, 67, 65, 74, 20, 1198
620 DATA 4E, 61, 6D, 65, 24, 53, 6F, 75, 72, 63, 65, 20, 44, 69, 72, 65, 1466
630 DATA 63, 74, 6F, 72, 79, 20, 4E, 6F, 74, 20, 46, 6F, 75, 6E, 64, 24, 1474
640 DATA 53, 6F, 75, 72, 63, 65, 20, 46, 69, 6C, 65, 20, 4E, 6F, 74, 20, 1410
650 DATA 61, 20, 44, 69, 72, 65, 63, 74, 6F, 72, 79, 24, 53, 6F, 75, 72, 1539
660 DATA 63, 65, 20, 6F, 72, 20, 54, 61, 72, 67, 65, 74, 20, 50, 61, 74, 1429
670 DATA 68, 20, 4E, 6F, 74, 20, 46, 6F, 75, 6E, 64, 24, 41, 63, 63, 65, 1381
680 DATA 73, 73, 20, 74, 6F, 20, 54, 61, 72, 67, 65, 74, 20, 44, 65, 6E, 1447
690 DATA 69, 65, 64, 20, 6F, 72, 20, 54, 61, 72, 67, 65, 74, 20, 45, 78, 1431
700 DATA 69, 73, 74, 73, 24, 0D, 0A, 6F, 72, 20, 24, 53, 6F, 75, 72, 63, 1327
710 DATA 65, 20, 61, 6E, 64, 20, 54, 61, 72, 67, 65, 74, 20, 44, 69, 73, 1407
720 DATA 6B, 20, 44, 72, 69, 76, 65, 73, 20, 43, 6F, 6E, 66, 6C, 69, 63, 1494
```

(Figure 2 continues)

Figure 2: *This BASIC program will also create RENDIR.COM.*

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The exception to the syntax used by the RENAME command is that wildcard characters (* and ?) are not allowed in source or target subdirectory names by RENDIR. PC-DOS Function 56H does not allow for them (for renaming any kind of file), and Function 17H (which does allow wildcards) cannot be used for renaming subdirectories. If you want, you can program them in yourself, but I didn't think it would be worth the amount of programming effort required. Renaming one subdirectory at a time seemed useful enough.

A HARMLESS QUIRK Using RENDIR is simple and straightforward with the exception of the quirk I alluded to previously. You will run into this only if you try to use RENDIR to rename the directory you are currently in. In this case, PC-DOS gets a bit confused as to what has occurred and doesn't immediately notice that the current pathname is no longer valid. The current directory name will not immediately change. As a result, if you issue a DIR command for the current directory, it will look as if nothing has changed.

On the other hand, if you then issue any command that requires PC-DOS to change the current directory temporarily, quite a bit will change, because PC-DOS will not be able to return to the current (now renamed) subdirectory. The reason is that the old pathname is no longer valid. Consequently, PC-DOS will leave the current directory set to whatever subdirectory had to be temporarily accessed.

The DIR and CHKDSK commands illustrate the difficulties encountered if you try to rename your current directory. If you ask DIR to list files in any subdirectory except the current one, it changes the current directory internally, lists the files, and then changes the current directory back to the original one.

This process is usually transparent to you, but if you have used RENDIR to rename the *current* subdirectory, you'll know all about it because when DIR is done, the current directory will be the one DIR changed to, not the one you started with. Similarly, CHKDSK always changes the current directory to the root di-

■ PROGRAMMING/UTILITIES

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740 DATA 72, 3A, 20, 50, 43, 2D, 44, 4F, 53, 20, 46, 75, 6E, 63, 74, 69, 1275
750 DATA 6F, 6E, 20, 35, 36, 40, 24, 0A, 0A, 0D, 20, 2E, 20, 2E, 20, 2E, 735
760 DATA 20, 41, 62, 6F, 72, 74, 69, 6E, 67, 0A, 0D, 0D, 24, 0A, 0D, 44, 1017
770 DATA 69, 72, 65, 63, 74, 6F, 72, 79, 20, 22, 24, 22, 20, 2E, 20, 2E, 1173
780 DATA 20, 72, 65, 6E, 61, 6D, 65, 64, 20, 74, 6F, 20, 2E, 20, 2E, 20, 1211
790 DATA 22, 24, 22, 24, 0A, 0D, 24, BA, 03, 01, B4, 09, CD, 21, B4, 30, 1044
800 DATA CD, 21, 3C, 03, 73, 06, BA, 1C, 02, E9, 75, 01, BE, 80, 00, 8A, 1445
810 DATA 0C, 32, ED, E3, 66, 8B, D1, 46, 8B, FE, FC, AC, 57, BF, CC, 01, 2346
820 DATA 51, B9, 20, 00, F2, AE, E3, 09, BB, 20, 00, 2B, D9, 8A, 87, EA, 1936
830 DATA 01, 59, 5F, AA, E2, E5, 8B, CA, BA, 02, 00, BB, 30, 01, B0, 20, 1783
840 DATA BF, 81, 00, F3, AE, 8B, F7, 4E, 41, E3, 22, 8B, FB, 8B, C1, AA, 2419
850 DATA AC, 3C, 20, 74, 01, AA, E0, F8, 29, 0F, E3, 11, FE, 0F, 8B, FE, 1985
860 DATA 4F, 41, 4A, 83, FA, 00, 74, 05, 83, C3, 4D, EB, D6, 80, 3E, 30, 1810
870 DATA 01, 00, 74, 07, 80, 3E, 7D, 01, 00, 77, 06, BA, 39, 02, E9, 00, 1043
880 DATA 01, 8B, 3E, CA, 01, BE, 7D, 01, AC, 32, E4, 8B, C8, 51, 03, F1, 1835
890 DATA 4E, FD, AC, 3C, 5C, 74, 0E, 3C, 3A, 74, 0A, AA, E2, F4, 83, C7, 1999
900 DATA 01, 57, EB, 07, 90, BA, A3, 02, E9, D6, 00, BE, 30, 01, AC, 32, 1733
910 DATA E4, 8B, FE, 8B, C8, 03, F9, 4F, B0, 5C, F2, AE, FC, 75, 0C, 49, 2429
920 DATA BF, 7E, 01, BE, 31, 01, F3, A4, EB, 19, 90, 80, 3E, 32, 01, 3A, 1668
930 DATA 75, 0E, BF, 7E, 01, BE, 31, 01, B9, 02, 00, F3, A4, EB, 04, 90, 1666
940 DATA BF, 7E, 01, 5E, 59, F3, A4, B0, 00, AA, BA, 31, 01, B4, 4E, B9, 1933
950 DATA 10, 00, CD, 21, 73, 03, EB, 0F, 90, BE, 95, 00, AC, 24, 10, 75, 1446
960 DATA 0C, BA, E0, 02, EB, 7B, 90, BA, C5, 02, EB, 75, 90, BA, 31, 01, 2043
970 DATA BF, 7E, 01, B4, 56, CD, 21, 73, 27, 3D, 03, 00, 75, 06, BA, FC, 1601
980 DATA 02, EB, 5E, 90, 3D, 05, 00, 75, 06, BA, 1C, 03, EB, 53, 90, 3D, 1404
990 DATA 11, 00, 75, 06, BA, 4B, 03, EB, 48, 90, BA, 72, 03, EB, 42, 90, 1603
1000 DATA B4, 09, BA, AD, 03, CD, 21, B9, 02, 00, BB, 31, 01, 80, P3, AC, 1767
1010 DATA 3C, 00, 74, 08, BA, D0, B4, 02, CD, 21, EB, F3, 83, F9, 02, 75, 1927
1020 DATA 0A, B4, 09, BA, BB, 03, CD, 21, EB, 0F, 90, B4, 09, BA, D2, 03, 1795
1030 DATA CD, 21, BA, D4, 03, B4, 09, CD, 21, B3, C3, 4D, E2, CF, EB, 11, 2154
1040 DATA 90, 52, B4, 09, BA, 0A, 02, CD, 21, 5A, CD, 21, BA, 97, 03, CD, 1724
1050 DATA 21, CD, 20, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 00, 278
```

(Figure 2 ends)

rectory before it does its work. If you have renamed the current directory using RENDIR and then issue a CHKDSK command, you'll wind up with the current directory set to the root directory.

RENDIR's quirk hasn't proved at all dangerous—nothing gets destroyed or damaged—but it seems best to avoid it. Avoiding it is actually simpler than encountering it. RENDIR's syntax makes renaming the current directory difficult because you have to specify the full pathname. PC-DOS's dot (. and ..) notation will not work because path specifications are not allowed in the target name. In fact, RENDIR's syntax is structured so that renaming a subdirectory of your current directory is the easiest job of all, and that's probably the way you would naturally want to use it most of the time. It's perfectly safe in any case, but quirks should be avoided wherever possible.

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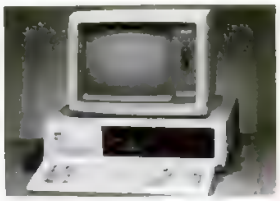
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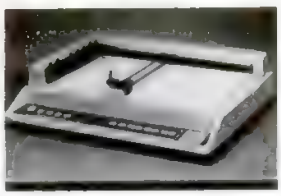
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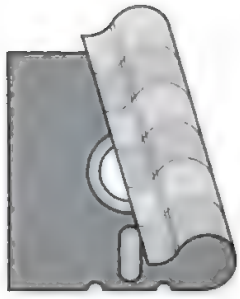
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Peoria, Illinois

```
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 5   Dollars  Fractions       Equivalent Value
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 8             3/16                  0.1875
 9          $1 3/4                    1.75
10          $5 7/32                 5.21875
11

   Column C is in currency format with 0 decimal places.
   Column D is in text format.
   Cells in column F are sum of cells in C and D, e.g.,
     formula in F7 is +C7+D7.
```

Figure 1: *Representing stock values as both decimals and fractions.*

MORE ON ZIP CODES

Several issues ago, Spreadsheet Clinic ran an item on entering ZIP codes in *1-2-3*. In normal numeric format, *1-2-3* suppresses leading zeros, so any ZIP code that begins with zero will lose its first digit. The solution was to write a macro that enters ZIP codes as labels.

This is a complicated solution to a simple problem. The simple solution is to use an often-overlooked feature of *1-2-3:* text format. Cells that have been formatted with /Range Format Text will treat numbers as text. Leading zeroes are displayed, and no commas or decimals are inserted. This format is perfect for ZIP codes.

Cells formatted as text have a value of zero for numeric computations and are treated as labels for data sorts. Equations will not be calculated.

Art Lowe
Plymouth, Michigan

Text format is a good solution to the ZIP code problem. It's also a handy format for troubleshooting spreadsheets, because it displays formulas rather than results. However, it's not correct to say that text format cells have a value of zero and that equations are not calculated. The item "Entering Stock Prices" in this column uses the text format to display fractions, which are simple formulas. When those cells are added to other cells, the equations are calculated, giving a value that is not zero.

PRINT FILE MYSTERY RESOLVED

In Spreadsheet Clinic (*PC Magazine*, Volume 5 Number 1), Juan Camps wonders why a *1-2-3* file that has been saved with /Print File will appear three rows below the cursor when it is imported. In your comments you point out that the file is also indented several columns.

There's an easy explanation for this "mystery." When you use the /Print File command, the data that goes to the .PRN file is exactly what would be sent to a printer. This means that margins, headers, and page breaks are included. The three blank lines at the top of the file are the top margin and the header line. The blank columns at the right are the left margin.

You can get rid of the blank lines by using the Unformatted option in the Other category of printer options. You can eliminate the blank rows by setting the left margin to zero.

James Parsly
Knoxville, Tennessee

Mr. Parsly wrote the first of many similar letters. Some of you were amused that I didn't see this rather obvious solution. Your friendly chaffing reminds a slightly pink-faced editor that Spreadsheet Clinic has a lot of sharp-eyed readers.

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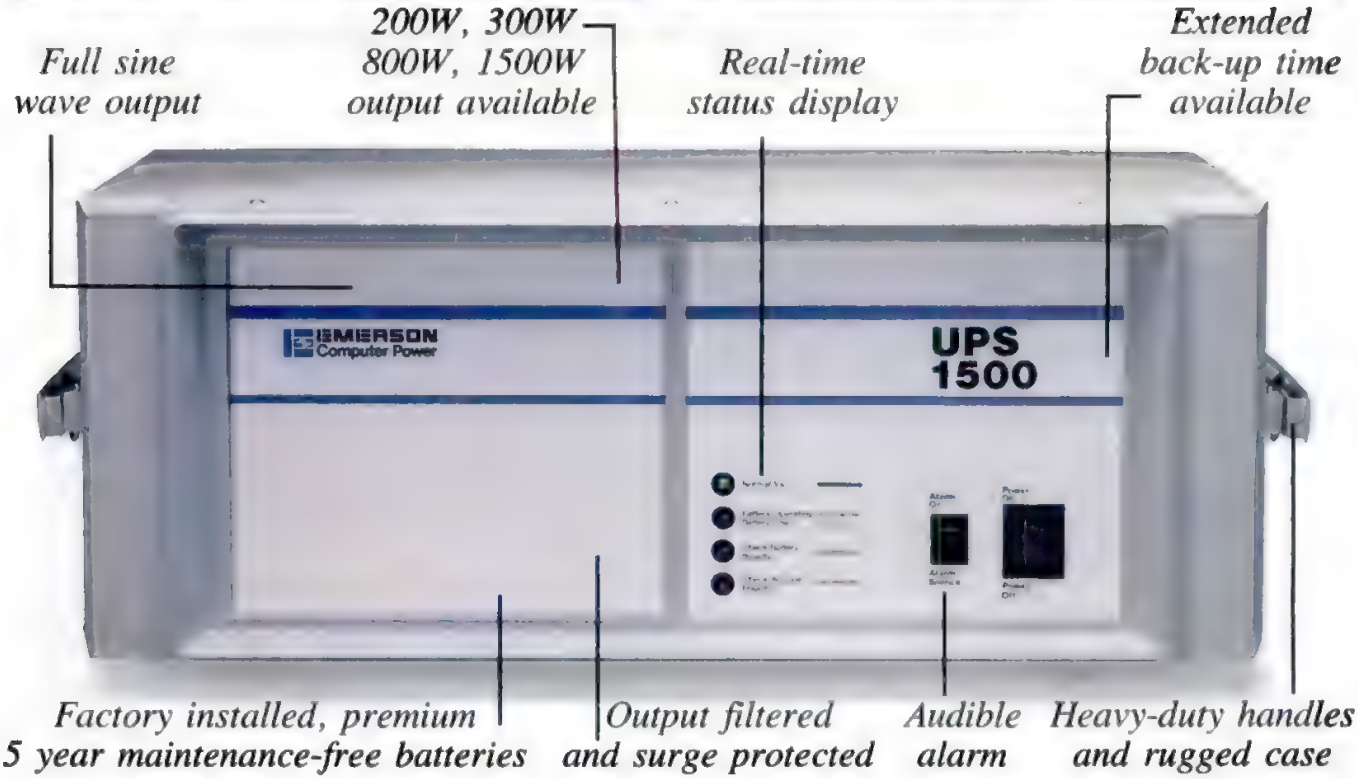
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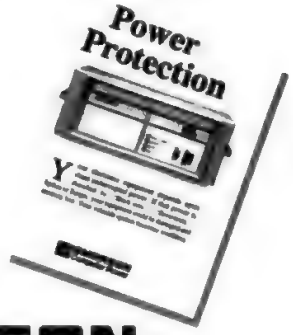
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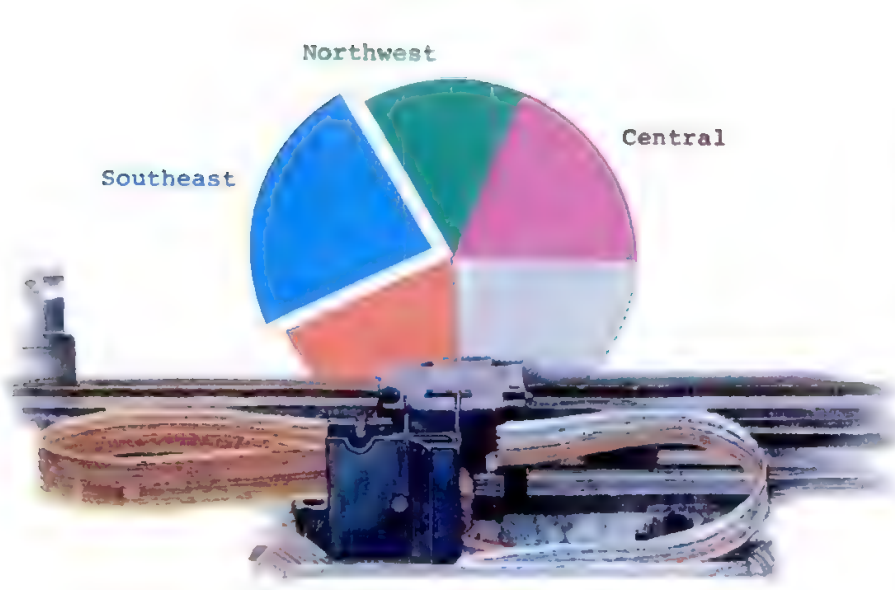
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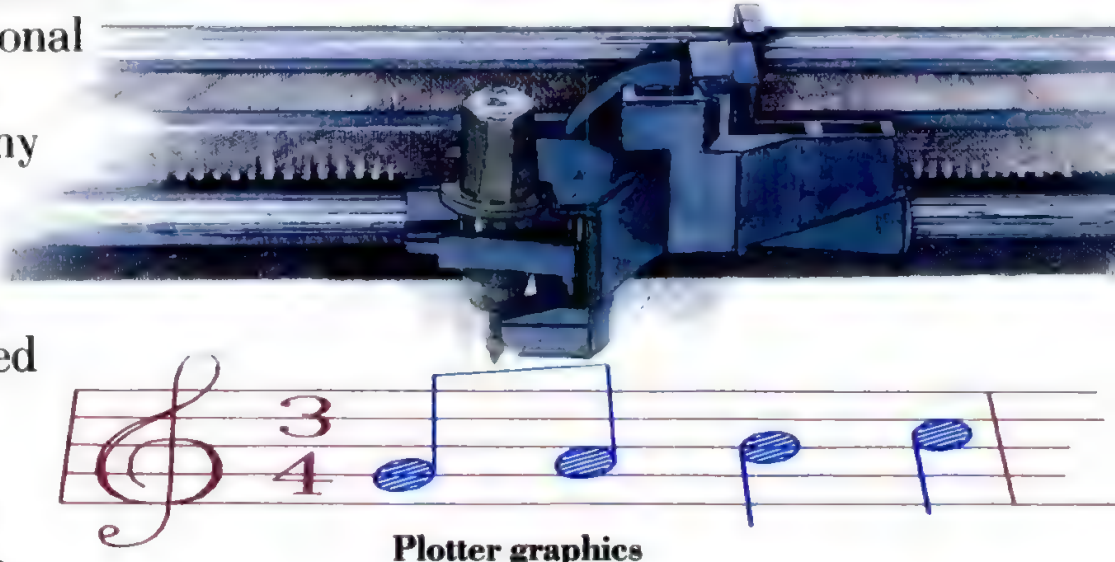


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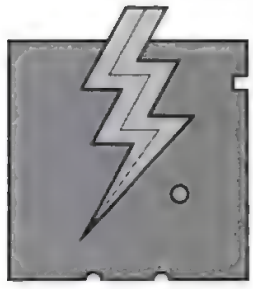
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■ EDITED BY CRAIG L. STARK



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TURBO BSAVE AND BLOAD

One popular technique in BASIC uses BSAVE to save screen images to disk and BLOAD to write them back to the display. Programs written this way do not have to spend time drawing to the screen; they simply load the appropriate file.

To emulate BSAVE and BLOAD within Turbo Pascal, I wrote a couple of procedures called ScrnSave and ScrnLoad to save and restore screen images. These are set up for the color/graphics display (which begins at segment $B800), but they could be modified for the monochrome display. When working with 80-column text screens, the length passed to the procedure is 4,000. For graphics displays, the length is 16,000.

The demonstration program puts the display in medium-resolution graphics mode and writes a few circles to the screen. (These circles require the GRAPH.P library, which is included with Version 3 of the Turbo Pascal compiler.) It saves the screen image to disk and waits for a keystroke. When the user presses a key, the screen is cleared and the program loads the disk file back out to the screen.

Jeffrey D. Phillips
Gainesville, Florida

A somewhat modified form of Mr. Phillips's program is shown in Figure 1. Unfortunately, the method of declaring variables at an absolute address in Turbo Pascal requires constants. Alternatively, these routines could be as generalized as are the BASIC BSAVE and BLOAD commands. But the technique works well; with a hard disk, the second image appears on the screen faster than Turbo draws the first image. With a more complex graphics image, of course, the difference would be even more dramatic. —Charles Petzold

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```
Program ScrnSaveLoad ;
{$I GRAPH.P}
Type Str255 = String [255] ;
Var Ch: Char ;
    I : Integer ;
Procedure ScrnSave (FName: Str255; Length: Integer) ;
   Var Buffer: Byte Absolute $B800:$0000 ;
       FileVar: File ;
   Begin
      Assign (FileVar, FName) ;
      Rewrite (FileVar, Length) ;
      BlockWrite (FileVar, Buffer, 1) ;
      Close (FileVar) ;
   End ;
Procedure ScrnLoad (FName: Str255; Length: Integer) ;
   Var Buffer: Byte Absolute $B800:$0000 ;
       FileVar: File ;
   Begin
      Assign (FileVar, FName) ;
      Reset (FileVar, Length) ;
      BlockRead (FileVar, Buffer, 1) ;
      Close (FileVar) ;
   End ;
Begin
   GraphColorMode ;
   For I := 19 DownTo 1 Do
      Circle (160, 100, 5 * I, 1 + I Mod 3) ;
   ScrnSave ('SCREEN.DAT', 16000) ;
   Repeat Until KeyPressed ; Read (Kbd, Ch) ;
   GraphColorMode ;
   ScrnLoad ('SCREEN.DAT', 16000) ;
   Repeat Until KeyPressed ; Read (Kbd, Ch) ;
   TextMode (C80) ;
End.
```

Figure 1: *This demonstration program shows two Turbo Pascal procedures called ScrnSave and ScrnLoad that work like BASIC's BSAVE and BLOAD for saving screen images to disk files and restoring them later.*

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USER-TO-USER

PC Magazine's readers share their favorite tricks for getting the most horsepower out of DOS, BASIC, and their systems in general.

FAST REBOOTS

A recent submission to User-to-User suggested a complicated method for rebooting your system that redirected a text script through DEBUG.

This method required two files and numerous disk accesses that are not necessary. The exact same procedure can be accomplished with one short .COM file. You can use DEBUG to create such a file, called REBOOT.COM, by typing in everything below, except the A> prompt, and hitting the carriage return at the end of each line.

```
A>debug
n reboot.com
rcx
5
e 100 ea f0 ff 00 f0
w
q
```

Once you've created this file you can reboot at any time in DOS simply by typing REBOOT.

Frank T. Clark
Berrien Springs, Michigan

This short program simply jumps to the reboot routine stored in your ROM BIOS (at address F000:FFF0). The longer procedure mentioned above was meant to illustrate an interesting technique rather than to show how small the code could be. However, the REBOOT.COM program does have a clear advantage in size and speed.

Phil Steele, a reader from Montville, New Jersey, points out that there's an even more efficient way to reboot your system—by using BIOS Interrupt 19.

Mr. Steele's method is a mere 2 bytes long, since all it does is invoke INT 19. To create it, make sure DEBUG is on your disk, type everything below, and hit the carriage return at the end of each line. (Note: this won't work if Sidekick *is loaded.)*

```
A>debug
n reboot.com
rcx
2
e 100 cd 19
w
q
```

You can adapt this 2-byte program to jump to BASIC by using Interrupt 18 rather than 19. Simply change the second line of the above script to

```
n gobasic.com
```

Then change the third line from the end to

```
e 100 cd 18
```

After you create this file, typing GOBASIC will jump to Cassette BASIC. This can be used as a primitive security measure.

EASY DATA SECURITY

I've come up with a simple but very effective method for keeping data on a shared hard disk secure from prying eyes. While it won't fool a real expert, I've found it does screen virtually all others out.

The trick is to use the ASCII character 255 either as part of a subdirectory name or a filename. To create a subdirectory that few, if any, users will be able to access, type

```
MD\SECRET
```

but add a CHR$(255) after the final *T* in SECRET by holding down the Alt key, typing 255 on the number pad (not the upper row of keys), and then releasing the Alt key. After this has been done, all a snooping user will get by typing CD\SECRET is a frustrating "Invalid directory" message.

You can also use this trick with filenames, either by putting the CHR$(255) in the middle of the file or at the end. In this case, all curious users will get is a "File not found" message.

Robert T. Collina
Lake Hopatcong, New Jersey

This simple trick will fool most naive users, who either won't see the CHR$(255) blank if it's at the end of a subdirectory or filename, or who will assume it's a conventional CHR$(32) space if it appears elsewhere in the name. And this technique has one additional benefit: Not only will unauthorized users not be able to type the contents of such secured files, they also won't be able to copy or delete them. Sometimes the simple tricks are the best.

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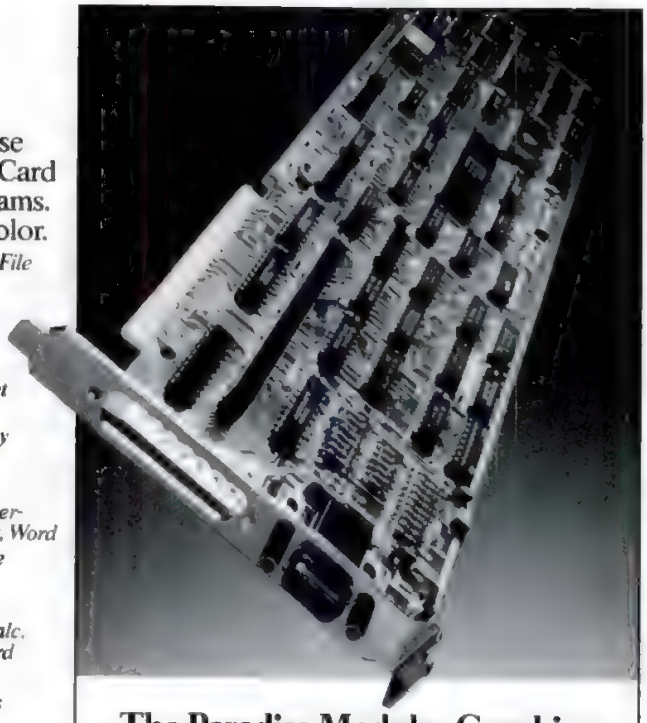
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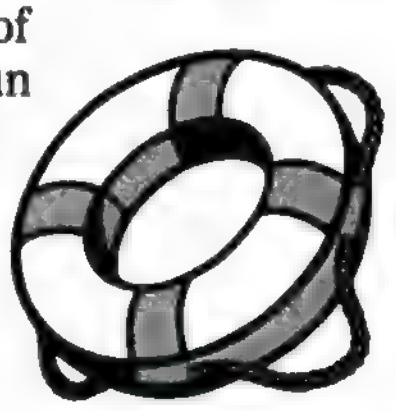
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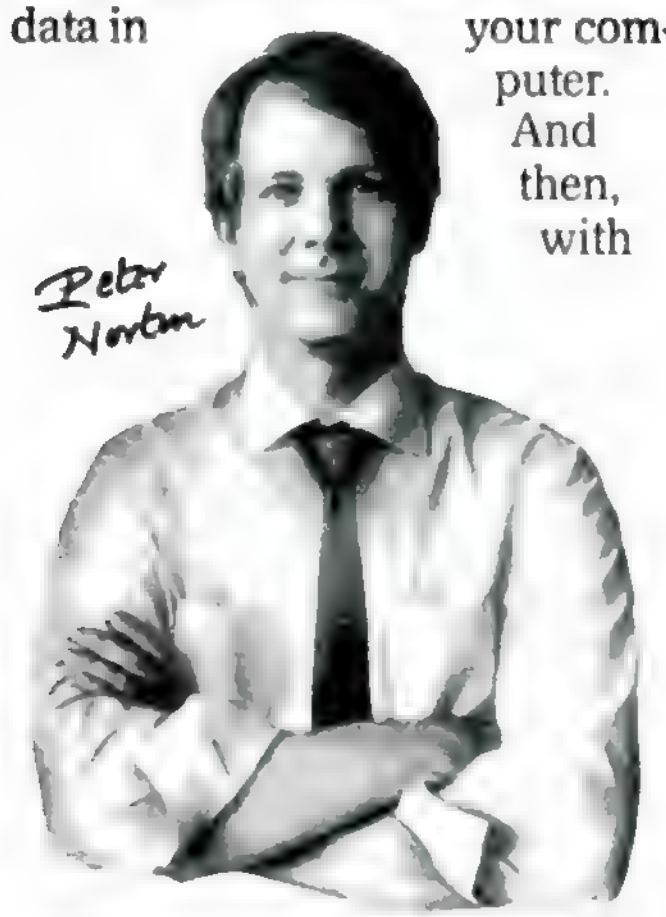
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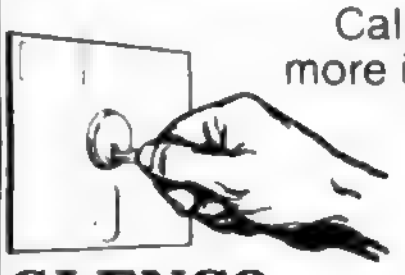
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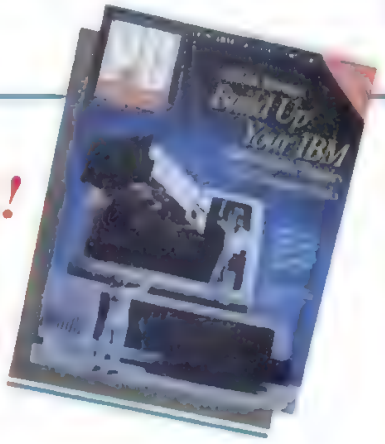
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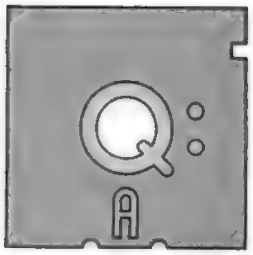
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■ EDITED BY CHARLES PETZOLD

PC TUTOR



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LEAVING WORK EARLY

Each day at 5:30 p.m., I execute a batch job on my PC. Some days, however, I don't feel like hanging around work until this late hour. Is it possible to create a program to make the PC run the batch job at 5:30?

Michael D. Herskovitz
New York, New York

Although some readers may wonder why the batch job has to be run precisely at 5:30, such a need could arise on a local area network, a mainframe connection, or on some other type of communications link. I'll assume you can't solve the problem simply by putting a

```
TIME 17:30
```

statement at the beginning of your batch file.

One easy way to solve your problem is by using the statement

```
BASICA GOHOME.BAS
```

as the first line in a batch file. The GOHOME.BAS program is shown in Figure 1. It simply loops until 17:30, at which point it exits to the system so the batch file can continue.

Line 20 in GOHOME.BAS is not strictly needed. However, it serves the function of giving coworkers the impression that your PC is doing some important work and that you've just stepped away from your desk for a moment. They will be less inclined to turn off your machine, and they'll never guess that you're already on the subway headed for home.

MYSTERIOUS MEMORY MALFUNCTION

We have been getting frequent "PARITY CHECK 1" "10000 (S)" errors (with system hang-ups) lately on our 640K IBM XT. We never get a power-on self-test (POST) error, and the error has never been flagged when we run diagnostics for the system board and RAM continuously. We can't figure out what could be causing the problem. Any suggestions?

Joan Sobkov
Baltimore, Maryland

The message itself means simply that a value was read from a memory location that did not agree with the value written there. I'm one of the few people who agree with IBM that stern measures are required in such cases, even to causing the system to hang up. If the error occurs in a piece of the program, you could easily erase a hard disk if you continued running.

Meanwhile, the parity error is caused by one of two things. The most obvious possibility is a hardware malfunction, perhaps a bad chip. That's less likely—not impossible, though—in your case, since both diagnostics read fine. Going beyond what you have done along the hardware route would involve having a competent technician look at the machine.

The second (and to my mind the more likely) problem is software errors. Is it possible that you have just started running a particular new program? Or maybe you are using some previously untried features of an older program. If the program has a small bug in it, that could easily cause a parity error.

The IBM PC uses dynamic memory for all storage. Dynamic memory requires constant refreshing (for example, a read pulse directed at the chip); otherwise the memory values decay. On the PC, the DMA controller handles refresh, which may lead to all sorts of software problems masquerading as apparent hardware problems. If you turn off the DMA controller for too long or transfer too much information, for example, some memory chips may not get refreshed. This would show up as a parity error.

```
10 WHILE TIME$ < "17:30:00"
20    PRINT RND,
30 WEND
40 SYSTEM
```

Figure 1: *When GOHOME.BAS is run at the beginning of a batch file, it will loop until the time shown in line 10, then exit BASICA to continue batch file execution.*

The PC Tutor solves practical problems and explains points of general interest. To see your questions answered here, drop a line to PC Tutor, *PC Magazine*, One Park Avenue, New York, NY 10016.

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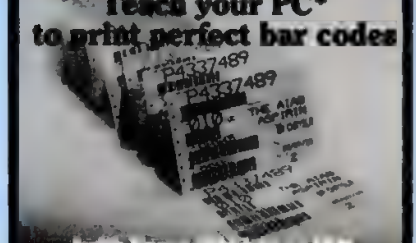
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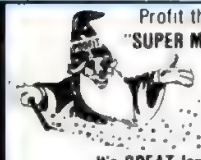
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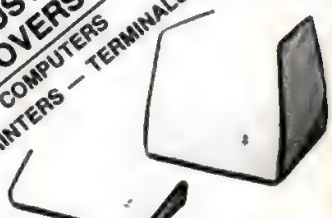
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COMING UP

AT HARDWARE DISASTERS IBM's powerhouse personal computer, the PC AT, once inspired rave reviews from its loyal aficionados, that is, back when it worked. But when this highly regarded productivity machine fails—and according to one particularly disgruntled user, the key word is *when*, not *if*—you and thousands of others will have a serious data-loss disaster on your hands. AT users are so outraged at IBM that *PC Magazine* has decided to speak out. Special projects editor John Dickinson reveals our astounding in-house failure rate and tells many a woeful tale. Senior editor Bill Howard talks to users, dealers, and retailers from coast to coast. Executive editor Paul Somerson recounts a spiteful AT disaster story in the angry words of Core International president Hal Prewitt. Editorial assistant Christina Dyar recaps the many AT alternative machines we've reviewed to date; assistant editor David Obregón adds two new ones to the list. And contributing editor Winn L. Rosch explains what's wrong with the AT's CMI drive and suggests alternative hard disks.

OKIDATA FOLLOW-UP Project Printer '85 uncovered some pretty disappointing data on the Okidata Microline series printers. Disappointing because their predecessors, the Microline 80s and 90s, had won many a PC user's heart with sturdy construction and good value. In response to our complaints, Okidata has improved the Microlines and earned itself a second look. PC Magazine Labs supplements the printer project in the familiar format with follow-up coverage of the new—and significantly improved—machines.

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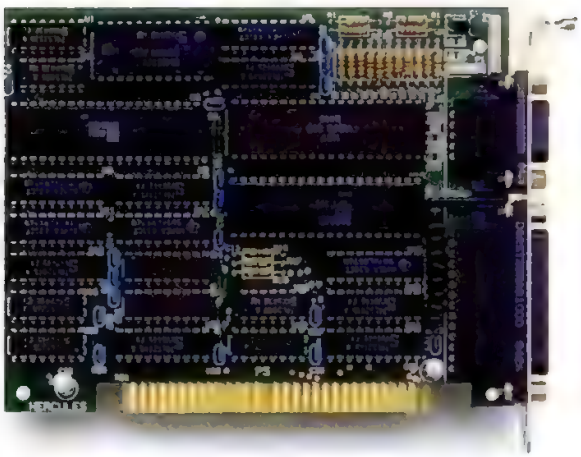
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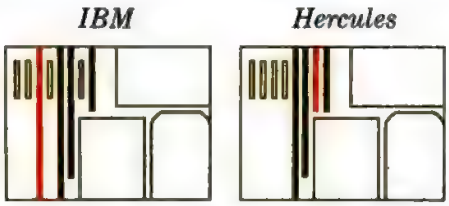
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■ BOOK REVIEW ■ MICHAEL GIANTURCO

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Computers are fast becoming a popular investment tool for the individual investor. Here are three books that can make your PC more useful than you ever imagined. *The Dow Jones–Irwin Guide to On-Line Investing: Sources, Services, and Strategies* and *Investing for Profit: All About Investment Management Software* are directories to investment services and products. *Stock Selection: Buying and Selling Stocks Using the IBM PC* is a "method" book that explains a specific approach to selecting stocks to buy.

THE DOW JONES BASICS Thomas A. Meyers, the author of *The Dow Jones–Irwin Guide to On-Line Investing*, succinctly covers the essentials of the Dow Jones information services in a single solid chapter, and he gets into the nuts and bolts of actually using the Dow Jones News/Retrieval service as a source of investment information. *On-Line Investing* uses screen shots to show you the kinds of information you can get and what you must go through in order to get them. Meyers is thorough in pointing out costs, potential pitfalls, and opportunities available to users of this important source of data.

Having covered Dow Jones News/Retrieval in 1 chapter, he provides 14 more chapters on the alternative sources accessible to on-line information gatherers. He discusses the investor-oriented databases of CompuServe, The Source, Warner Computer Systems, Nite-Line, Telescan, FCI-Invest/Net, Vickers On-Line, and NewsNet. By picking and choosing among these databases, you can find the most-economical sources for current and historical quotes as well as fundamental data (including balance sheet and income statement data, insider and institutional transactions, earnings estimates, and expert opinion). Two chapters explain the investment information that is accessible via two of the on-line brokerages (Schwab and Fidelity), and a closing chapter touches on investment software.

On-line interactive database services are probably approaching their zenith. Newer technologies and services include low-cost FM-to-computer transmission of real-time and current quotes, corporate news, and earnings. Meyers includes a brief chapter on FM, though at the time he wrote the book, Lotus had not yet stepped into the field. Quite current fundamental databases are available on floppies by subscription at reasonable cost. One floppy database (Value Line's) can be updated on-line in a single very brief "whoosh" download. Before long we will probably get Bernoulli disks and massive optical disk storage of all kinds of historical investment data. These technologies should either supplant the interactive on-line services or drive down their prices. But for the moment, on-line databases are central to computerized investing. Meyers treats the subject comprehensively. His introductory advice on controlling on-line cost by going straight for what you want and never browsing ("Avoid spontaneity!" he writes) would make a great lapel button slogan. I highly recommend this book.

■ "The Dow Jones-Irwin Guide to On-Line Investing" gets into the nuts and bolts of using the Dow Jones News/Retrieval service.

A SOFTWARE BUYER'S GUIDE *Investing for Profit* purports to do for investment software what Meyers has done for interactive investment databases—provide a comprehensive directory and buyer's guide. There is some detailed information in the book, but it is too thin to deliver on the promise of its subtitle, "All About Investment Management Software." It reviews 19 of the over 300 software packages currently offered to investors. Of the 19, a good number are relics. Even the more current programs reviewed here are one product generation back.

The latest generation of investment software figuratively stands on the shoulders of these older packages. The product reviews in this book are detailed and well done, but they will give you little basis for judging the newer programs now available. One of the technical analytical programs reviewed (Anidata's *Market Analyst*) is no longer for sale at all as a standalone product. It was sold to Interac-

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tive Data and repackaged as a component of its *Active Investor* integrated package. No integrated packages are reviewed.

One strength of the book is its reviews of heavy-duty multiple portfolio management programs for brokers and advisors. Eight of the 19 products reviewed are portfolio managers. The fundamental stock analysis programs covered here are all first-generation screening programs. No intensive fundamental valuation programs (like the Jenks' programs discussed below or the *Compustock* package) are considered. The book was produced by a group, which may account for its tardiness and for the lack of any overarching perspective on the 19 products.

A TIMELY TUTOR Although *Stock Selection: Buying and Selling Stocks Using the IBM PC* has the earliest copyright date, it is in many ways the most timely of all these books. It was written in late 1982 and published in 1984, but it is based on four decades of experience in the evaluation of stocks. The book and program have two authors, Jeremy C. Jenks and Robert W. Jenks, father and son. The first-person narrator is the senior Jenks, who writes and thinks with great clarity.

The book and the stock selection program are framed around a generalized equation for the valuation of stocks. "The method is simple: Yield plus Growth equals Total Return; Total Return multiplied by a Quality Rating Factor equals Adjusted Total Return; Adjusted Total Return divided by the Price/Earnings ratio

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THE PACK.



equals Relative Value."

This verbalized method of presenting an equation, rather than laying it out in an algebraic format, makes you imagine the book was dictated aloud and transcribed literally. It recurs throughout the text and is sometimes hard to follow, but this is a minor problem. Two chapters are devoted to a detailed discussion of each of the major terms of the equation.

A chapter on methods of predicting earnings growth covers projection by linear regression, incorporation of published earnings estimates, calculations of growth from "plowback" of earnings into the business, and other approaches. The authors don't attach too much weight to projections made by linear regression analysis (a sensible reservation), though the software provides a utility to run them.

Another chapter is devoted to the Jenks' Quality Rating Factor. It shows how to construct this factor using stock quality ratings published by services such as Standard & Poor's, how to treat certain balance sheet items, and how to account for the effects of inflation on stock valuation.

Books that advocate a specific stock market formula, as this one does, are often hotly argued polemics that promise to make you rich straightaway. *Stock Selection* is refreshing. The Jenks' style is cordial and matter of fact throughout. They unfailingly point out their assumptions and never make extravagant claims. What they offer is a set of realistic and workmanlike tools for checking a stock's inherent value relative to that of other, similar stocks and relative to its current price. These helpful tools are what you get if you buy the book and the programs that accompany it. One utility produces scatter charts—there are all sorts of ways to use it, whether you adhere to the Jenks' formula or not. In sum, you might not use every idea exactly as presented, but you will almost certainly find several handy tools and techniques for refining your own investment approach.

Michael Gianturco is president of High Technology Investments in Houston.

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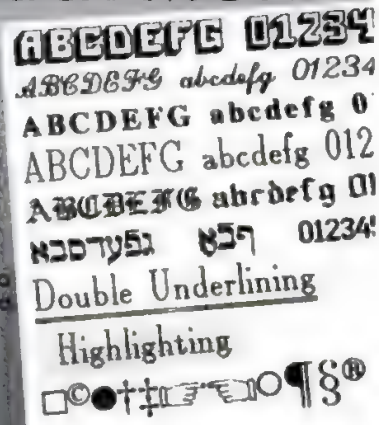
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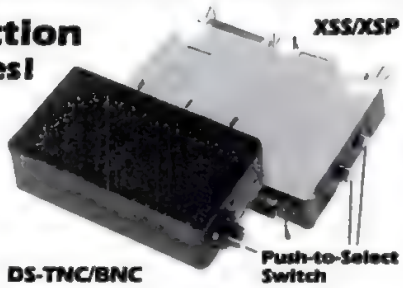
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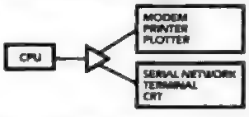
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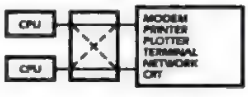


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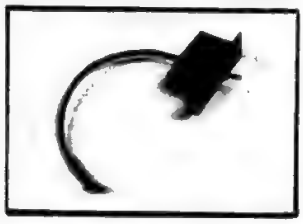
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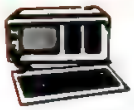
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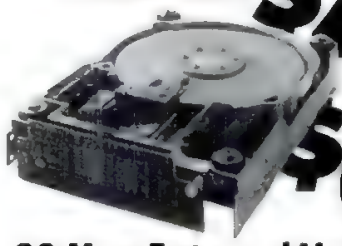
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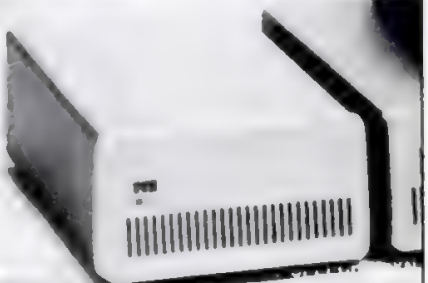
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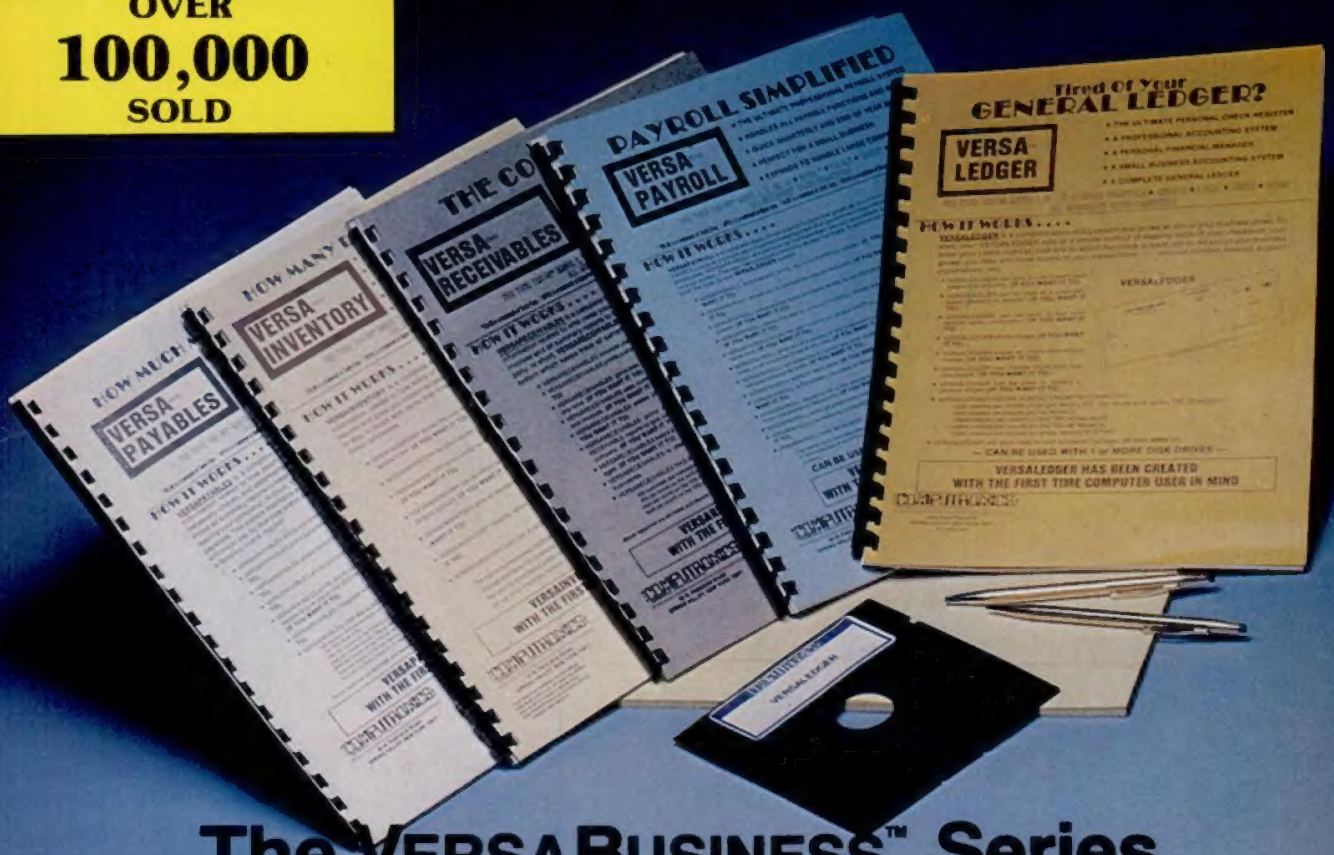
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